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False Trails

THERE may be some symbolic significance in the failure of the White House to find the original inflation control bill sent down by Congress in the closing days of its session. If the physical embodiment of this legislative missive corresponded to its actual substance as a check on inflation, its misplacement by the White House could readily be understood. For never has a legislature made so much noise in giving forth a law and had so little to show in the form of effective statute; never has Congress fanned the air so vigorously and at the same time managed so successfully to avoid its apparent objectives. If these, our solons, reveal equal skill in hunting, then wild life in this country is safe.

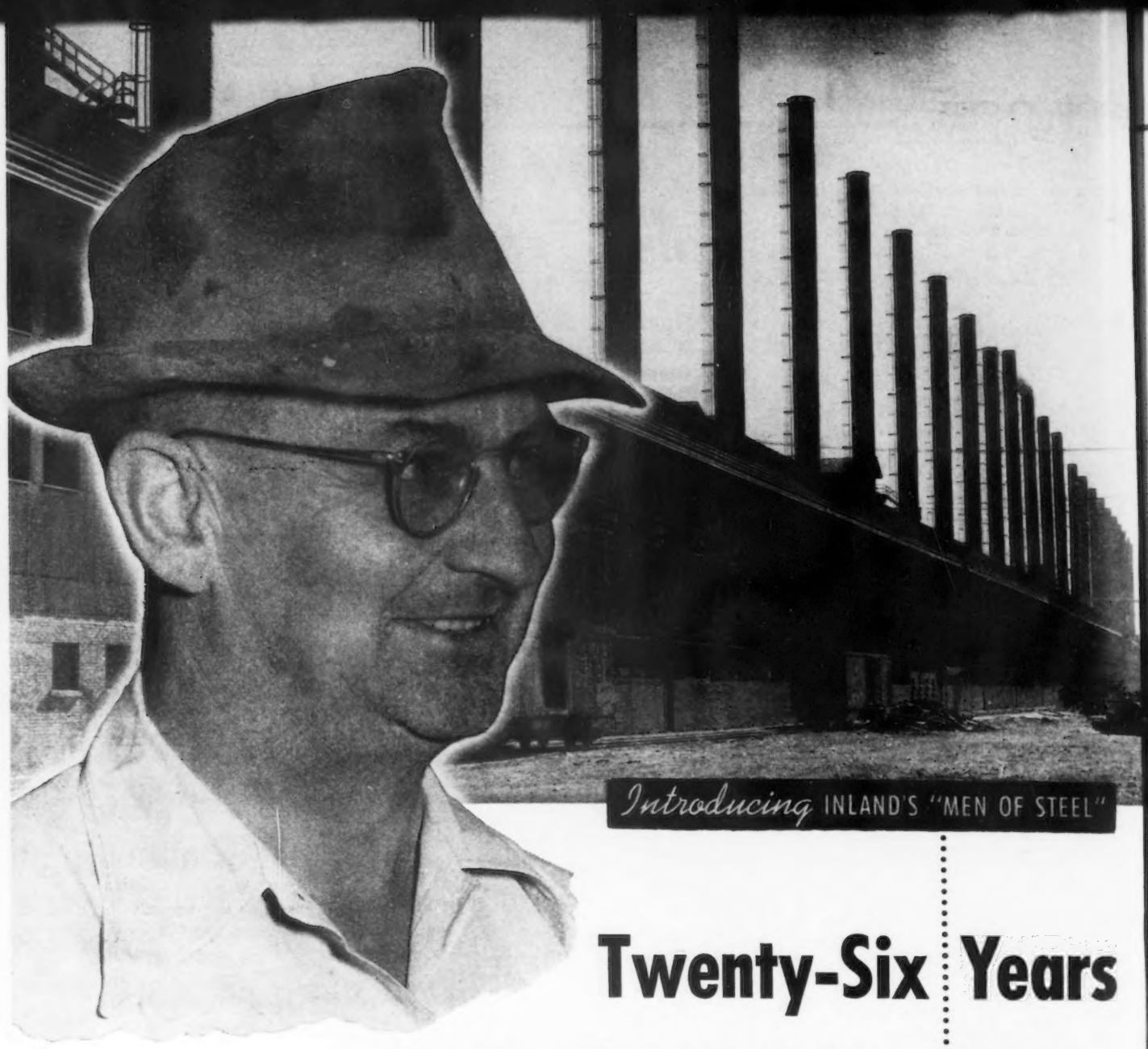
The best that can be said of the bill is that it is innocuous, although our distillers will dispute even this mild reproach. Whether the voluntary cooperation by private business which the measure grants amounts to anything more than a gesture remains to be seen. The administration has already been "exercising"—with certainly no visible effects upon the H. C. L.—the export controls which the act extends. It may continue to scold "gamblers" on the grain exchanges. Possibly some of our citizens are so ill-informed as to believe that the grain markets are responsible for inflation. If so, they must be close kin to the folk who think that thermometers are responsible for summer heat and winter cold.

The sad truth is that this whole discussion of inflation, particularly in the Washington forum, is one of the less creditable manifestations of democracy at work. H. C. L. has suddenly become an acute political issue with real votes involved. It has already served as the pretext for demanding another round of wage increases. Applicants for continued American aid allege that prior contributions to their recovery have been ineffective because prices have gone up so far. Reserve authorities, with characteristic myopia, suggest radical new credit controls on the ground that expansion of bank loans is responsible for the high cost of beefsteak and baby sitters.

Never has a government been so clearly responsible for an effect whose causes it seeks so energetically to fasten upon innocent parties. Redundant credit and currency, low rates, credit based on political rather than business considerations, higher costs of production, heavy demand and imprudent buying—these are the causes which careful students consider responsible for a shrinking dollar.

Throughout the thirties the government deliberately cut the gold content of the dollar, repudiated its gold obligations, depressed the money rate, abused the central bank, chronically lived beyond its means and provided artificially easy access to credit by farmers, home builders and G.I.'s. Its spokesmen incited labor to demand "48 hours' pay for 40 hours of work" on the ground that corporate profit margins could absorb the added cost. Millions of taxpayers' funds have bought potatoes, oranges, eggs, tobacco, turkeys, prunes, etc., for the avowed purpose of keeping prices up. Preemptive buying during the past year has taken more than 18,000,000 tons of food for Europe. No graduate degree in economics is needed to understand that here are the authentic causes of H. C. L.

Joseph Stagg Lawrence



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► Several producers of consumer durables such as refrigerators, non-automatic washing machines and ranges believe these lines will be in very good supply before the end of this year. Few are saying this publicly, but all are gearing sales staffs for the selling job ahead.

► Ferro-chromium has been successfully melted in this country for the first time in a gas fired reverberatory furnace. First commercial installations are planned for the first part of this year.

► A group of firms in the British motor industry has set up a British Motor Racing Research Trust, with the object of retaining for Britain a premier place in world motor racing and engineering. A car representing the combined effort of all the makers of component parts in the country will be built.

The British Government is lending sympathetic support to the group, which is headed by racing enthusiast Raymond Mays.

► Despite increased output, Aluminum Co. of America's 1947 sales were much lower in proportion to the rest of the industry than they were in 1946. In 1946 Alcoa accounted for 70 pct of the industry's total tonnage, but fell to 56 pct last year as its competitors got their facilities into better production and ran closer to capacity.

► There are growing indications that the new model cars are being designed as much for production economy as for eye appeal. Car builders are carefully reviewing all their factory scheduling in order to group kindred operations and reduce production costs. Interchangeability of parts will be even greater than heretofore.

► This year will see a big drive to sell ac welders as replacements for dc units. The sales arguments boil down to the assertion that if the present national ratio of 20 pct ac and 80 pct dc welders were reversed the saving in power cost would pay for all the electrodes used in this country in a year.

► The new Kaiser-Frazer convertible to come out this spring will be of entirely new design. It will not be a "can opener convertible" cut down from the present model.

► Public works requirements over the next few years might approximate as much as $75 billion. Even spread out over 15 years such a huge public works program would require average expenditure of $5 billion annually. This would be 2½ times the 1947 rate. Works officials say backlog of needs as of last June amounted to nearly $20 billion.

► Before the war Belgium exported between 300,000 and 400,000 tons of scrap each year to Germany, Great Britain and Poland, as compared with 150,000 tons imported from the Netherlands, United States and Great Britain. But at the present time only a third of the scrap supply in Belgium is home scrap. This is partially explained by the great demand for steel for building.

► Current price increases in pig iron are reported to be due largely to the failure to extend the housing subsidy on foundry pig iron after the end of December.

► United States tin stocks increased almost 10,000 tons during the third quarter of 1947 partly because consumption was down in all categories except tinplate but largely because of the arrival of delayed shipments from accumulated stocks at foreign ports and smelters.

► The Egyptian Government recently signed contracts with two Swedish firms for equipment intended for the big power plant at the Assuan Dam on the Nile. The orders, totaling about $9 million, cover only part of the Egyptian requirements, and similar contracts are reported to have been signed with other countries.

► Production is just getting underway on a new verticle type 1 hp lightweight motor in a midwestern plant. The motor weighs only 17 lbs and will run 7 hr on a single gal of gas.

Continuous

By E. S. KOPECKI
Metallurgical Editor
THE IRON AGE

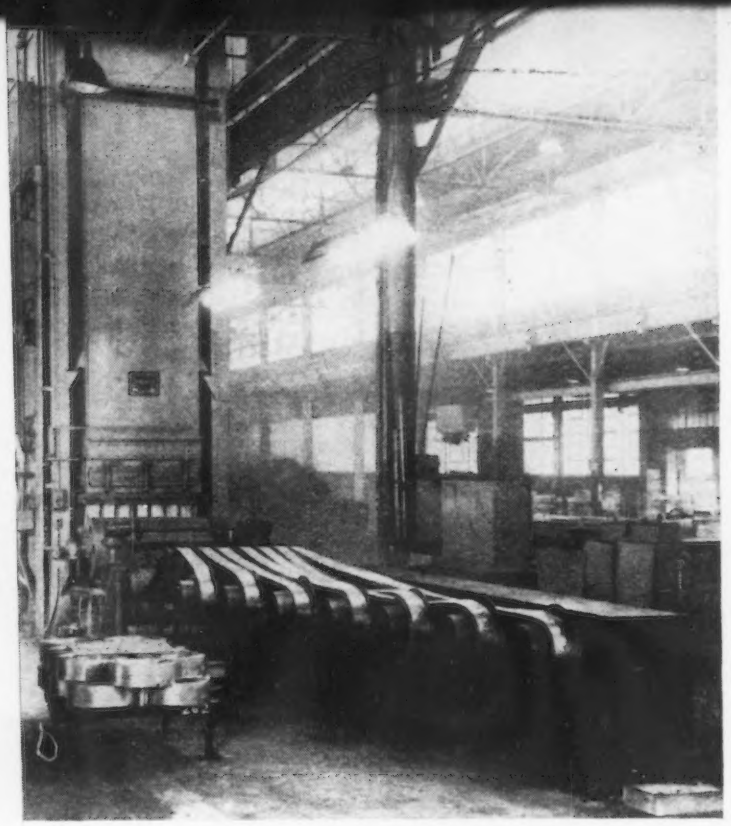


FIG. 1—View of discharge end of a 135-kw vertical, continuous strip annealing furnace in operation at the Riverside Metal Works, Riverside, N. J. Note that seven strands are being annealed simultaneously.

A PROBLEM of great concern to many a producer of nonferrous metals and alloys has, for many years, been the inadequacy of the strip-annealing operation. The conventional method, that of heat treating the strip in coiled form, in a batch-type muffle annealing furnace, has presented a not completely satisfactory tool, insofar as high quality production is concerned. Not only is the material nonuniformly annealed within any one coil, due to the mass effect, but variations exist from coil to coil. Subsequent costly pickling and hand polishing operations have been far from successful in improving the stained surface.

Most of these old-type installations have made way for improved methods of annealing strip, and various types of continuous furnaces are now in operation. One such modern type installation, see figs. 1 and 2, the vertical, continuous, strip annealing furnace manufactured by the Drever Co., Philadelphia, appears to have been accepted by the nonferrous industry as an important factor in the production of quality strip at a cost comparing favorably with previous batch units.

A typical vertical, controlled atmosphere furnace is shown schematically in fig. 3. Although the overall dimensions do not vary appreciably from one type to another, it is of interest to note that one such installation, designed for a capacity of 1500 to 2000 lb per hr (120 kw), is 25 ft 8 in. high, 9 ft 4 in. wide and 46 ft long, while a smaller unit, designed for about 750 to 1000 lb per hr (75 kw), measures 21 ft in height, 8 ft in width, and 40 ft in length.

As a coil gradually unwinds, at the pay-off reel positions, another coil is rolled into place and spot welded to the trailing end of the preceding coil. This action is repeated as annealing proceeds and serves to maintain a continuous length of strip passing through the furnace. In this type of an operation, it is of course imperative that the strip be in a continuous length from the pay-off reel to the pinch rolls. As a matter of fact, when the furnace is shut down for any reason, special strands (Inconel, Nichrome, etc.) called "leaders" are run through the furnace with the production material and the furnace is turned off when the leader is in proper position, i.e., with the two ends emerging from the furnace chamber. To resume operations, a coil of production strip is welded to the leader and run through the heating chamber.

The strip rounds the rotating drum (A fig. 3), and enters the controlled-atmosphere heating chamber where it is exposed to direct radiations from wall-type resistor heating elements contained on two walls of the chamber. The chamber is divided into three zones, with the temperature of each zone individually controlled. To accommodate different types of materials, the temperature of the chamber and the speed of the strip can be adjusted so that the strip is certain to reach a preset temperature.

Rounding the water-cooled drum (B), the strip passes into the cooling zone, on one side of which is a water-cooled chute, and is subjected to a controlled-cooling cycle. With the pinch-rolls exerting tension on the strip, it is drawn through the furnace, and pushed ahead toward the take-up blocks. The strip is then severed, manually, from the adjacent coil (at the spot welded location), the loaded roll removed from the block, and an empty roll installed to receive the succeeding strip.

Retention of surface quality throughout the annealing operation is attributed to the use of a controlled atmosphere, dissociated NH_3, in the

Annealing Nonferrous Strip

Use of the controlled atmosphere, vertical strip annealing furnace is reported to have made possible a close control over the surface quality and metallurgical characteristics of many types of nonferrous metals and alloys. Employment of an electrical heat source enhances control over temperature conditions, while the "vertical" feature offers substantial saving in floor space. A description of the equipment is presented in this article, supplemented with some notes on its use in four nonferrous plants.

heating chamber. Some manufacturers utilize ammonia atmosphere at other locations in the plant, and usually have a central souree of supply. In plants where use of ammonia atmosphere is limited to the vertical strip annealer, however, a small unit can be installed in the immediate vicinity of the furnace. An unusually compact installation is illustrated in fig. 2, with the dissociator located on an elevated platform.

Vertical furnaces are designed for accommodating a predetermined maximum width of strip material, whether it be in the form of a very wide single strip or several strands of lesser width. For example, the seven take-up blocks shown in figs. 1 and 3 indicate that up to seven narrow strands (2 in. wide) can be run through the furnace simultaneously.

In general, vertical, continuous strip annealing furnaces are classified into two types: (1) General purpose furnaces for multiple strip, and (2) high production furnaces for a single wide strip. Under type (1) are three categories:

(A) For less than 500 lb production per hr. multiple strands up to eight, individual strands up to 8 in. wide. This furnace is used largely for nickel and nickel alloys, gold plate, bimetallic alloys and in general for high quality strip materials.

(B) 750 to 1000 lb per hr for nonferrous alloys such as nickel silver, phosphor bronze, beryllium copper and other copper alloys. This furnace will have an output in multiple strands of up to 1200 lb per hr depending on the grain size characteristics of the finished material. The larger the grain, the less the output.

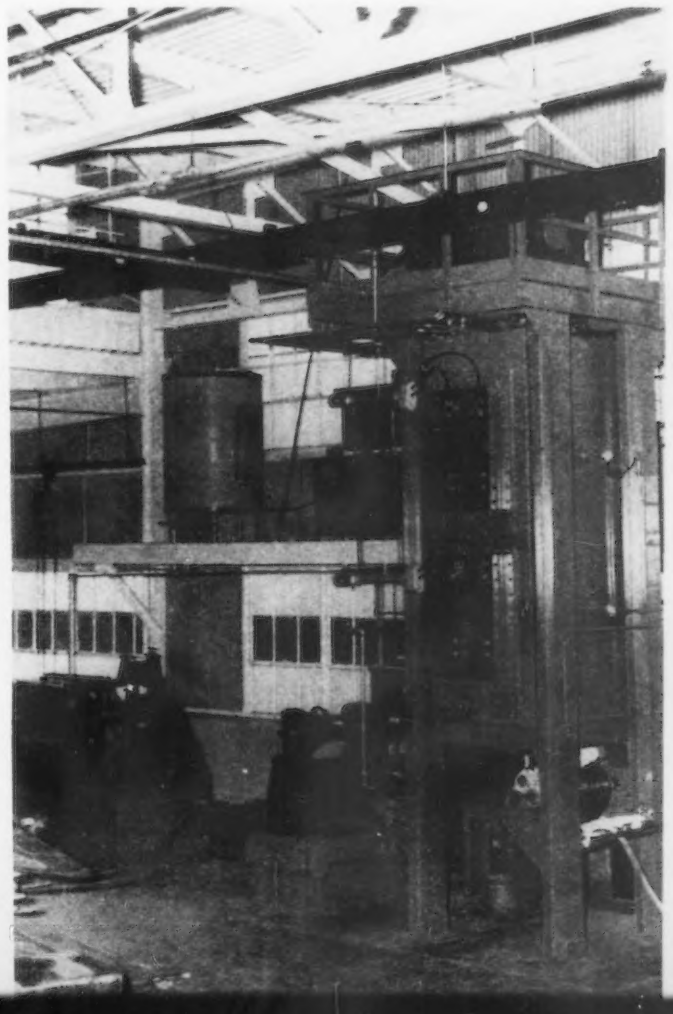
(C) 1000 to 1500 lb output generally used for materials as under (B). Under type 2 is the following category:

(A) Single strand wide strip furnace for copper and copper alloys with a rating of 4000 lb of annealed material per hr in gages up to 0.05 and in widths up to 30 in. This is a double pass furnace, approximately 35 ft overall height.

Users of the vertical furnace express enthusiasm over the uniformity of anneal, and the elimination of scratching, marking, or abrading of the strip surface. Another advantage lies in the compactness of the equipment, with the vertical design responsible for substantial reduction in floor space requirements.

Rate of output, from the standpoint of nonferrous materials, is definitely limited when running lightweight strip. A coil weight of only about 180 lb calls for frequent joining and separating of adjacent coils, and since these opera-

FIG. 2—A compactly designed installation at the General Plate Div., Metals & Controls Corp., Attleboro, Mass. Observe 500 cu ft per hr ammonia dissociator installed on elevated platform as a space-saving measure.



tions must be performed while the strip is in motion, strip speeds greater than about 15 fpm would be extremely difficult, if not impossible, to handle. However, for longer strips and heavier coils now becoming usual in the nonferrous industry, speeds as high as 150 to 200 fpm are possible with coils weighing about 2000 lb.

A single coil of strip may pass through the furnace several times, inasmuch as annealing is oftentimes required between successive rolling cycles. No degreasing of roll oil is necessary, since the oil burns off in the first heating chamber.

Of the four plants whose annealing operations are to be described in this article, the two furnace installations at the Driver Harris Co., Harrison, N. J., should probably be mentioned first, since to this company goes much of the credit for helping pioneer this development. One unit has been in operation for approximately 18 years, and the other about 14 years. Comparative results between this and previous methods are lacking, and well they may be, since company operators and officials can scarcely recall a time when the continuous vertical strip annealer was not in use.

At Driver Harris, the furnace installations are utilized for annealing pure nickel and nickel alloys, in strips varying from 1 to 10 in. in width —with the smaller sizes run through in multiple strands. Furnace temperatures vary from 1800° to 1850°F, depending upon the heat requirements of the material being annealed.

Considerable success is reported in obtaining a high quality of surface finish and metallurgical characteristics. Some nickel alloys are particularly sensitive to work hardening, and a method such as this, which makes possible both precise temperature control and uniformity of heat treatment, is a distinct advantage from the standpoint of rolling operations. The cost factor of special surface cleaning after each anneal, especially when a coil of strip must be subjected to many rolling-annealing cycles in the course of manufacture, can assume considerable proportions.

Another economic factor that merits consideration is that these two furnaces, in continuous, round-the-clock operation for lengthy intervals, have required very little attention or maintenance.

The Riverside Metal Co., Riverside, N. J., also operates two vertical continuous strip annealing furnaces; one with a 9-ft heating chamber (90 kw), and the other with a 12-ft heating chamber (135 kw). Cupro-nickel alloys, various brass compositions, copper-beryllium alloys, phosphor-bronzes, and many types of nickel silvers eventually pass through the annealing units in the course of manufacture.

Width of strip annealed varies from 2 to 8 in. When annealing the smaller size, six strands can be heat treated simultaneously in the 9-ft unit and seven in the 12-ft furnace. Thickness of strip ranges from 0.005 to 0.05 in.—thickness limitation on the upper limit arising from the difficulty in bending the larger sizes around the water-cooled drums. Linear speed of strip travel can be varied from 3 to 15 fpm, depending upon the size of strip involved. Furnace temperatures

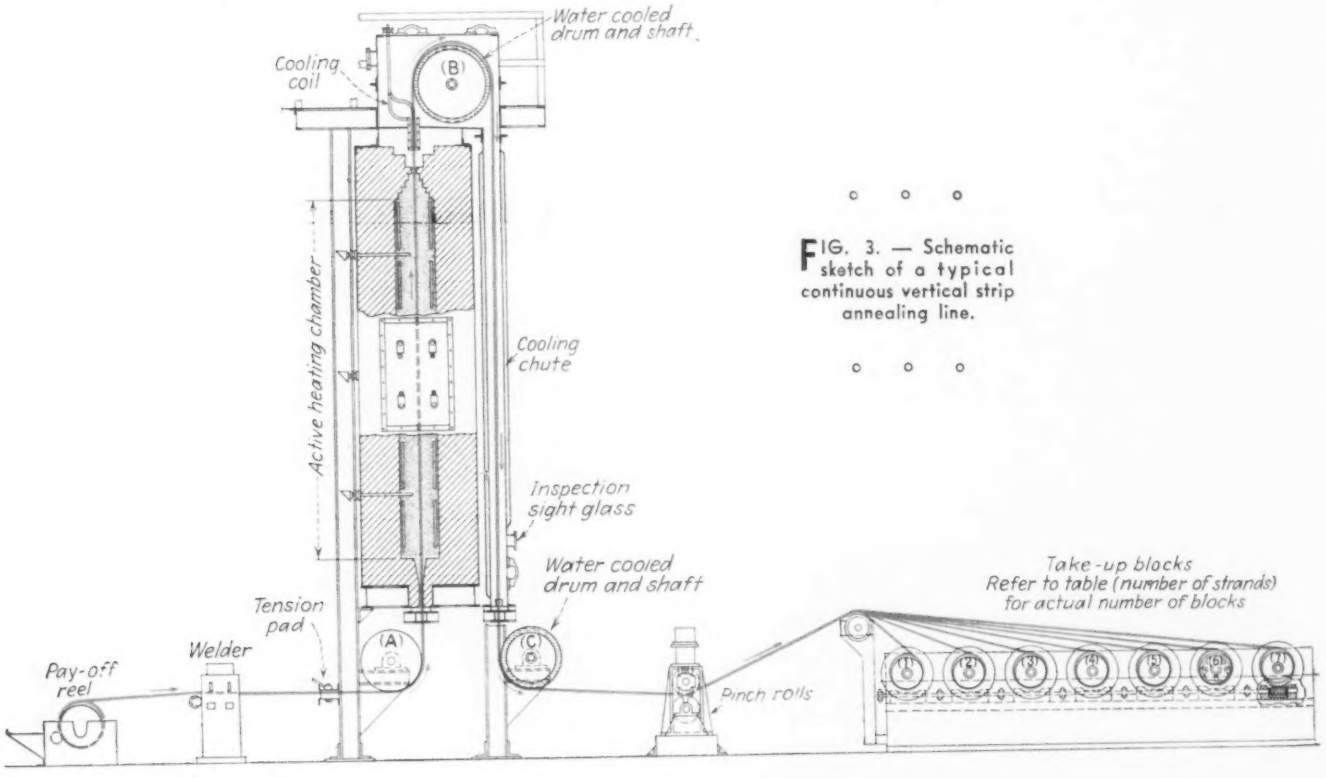


FIG. 3. — Schematic sketch of a typical continuous vertical strip annealing line.

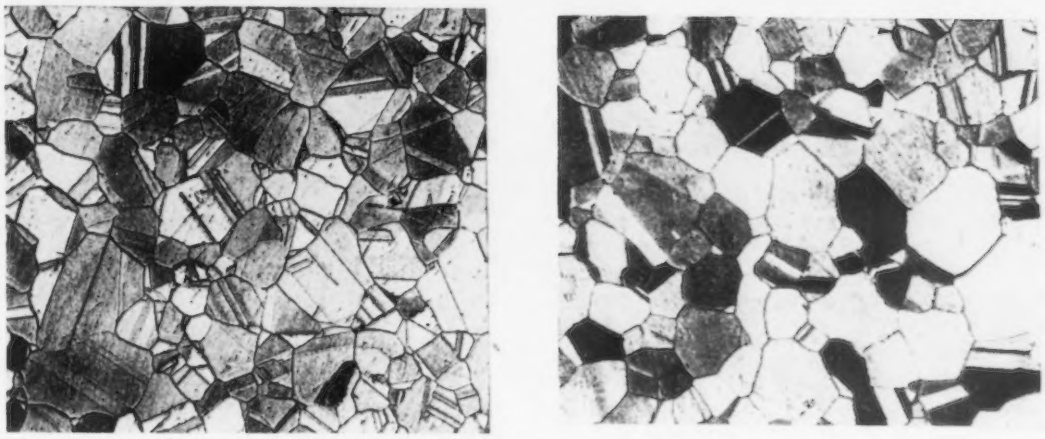


FIG. 4—Grade A phosphor bronze (nominal composition: 95 pct Cu, 5 pct Sn, 0.15 pct P), (A) as annealed in a batch-type furnace, and (B) as annealed in a continuous strip furnace. Grain size 0.090 mm. Etched with ammonium hydroxide and hydrogen peroxide. Note nonuniformity of individual grains in (A) as compared with (B). 75X.

used to date have ranged from 1300° to 1650°F. Atmosphere input into the smaller furnace is about 150 cu ft per hr.

An interesting feature of the design of the furnace is the fact that with annealing operations limited to 5 days per week, the furnace is not idled during the weekend period, but is completely shut down. In resuming operations the ammonia dissociator and the heat (electrical) source are turned on, and in about 3½ hr the furnace is up to heat and the atmosphere in the heating chamber has been well flushed.

The surface finish obtained is much superior to that previously realized with the batch-type muffle furnace, and pickling operations have been considerably reduced. Further, the improvement in uniformity in heating from coil to coil and with any one coil makes possible closer adherence to hardness specifications as well as to grain size and surface finish requirements.

Similar advantages arising from use of the Drever unit are reported by the Seymour Mfg. Co., Seymour, Conn., in annealing nickel silver alloys, phosphor bronzes and various brass compositions. Normal production involves annealing of four 6-in. strands simultaneously, although furnace construction is such that three 8-in. wide strands or a single strip up to 15 in. in width can be accommodated.

The installation at Seymour is designed for an output of approximately 2000 lb per hr, and can handle strip ranging from 0.005 to 0.06 in. thick. The three heating zones operate at 1800°F max.

Corroborating the opinions expressed by other producers the metallurgical department of Seymour points out that not only does the vertical unit compare very favorably with the batch-type muffle annealing furnace from an economic standpoint, but also makes possible the realization of a pronounced improvement in surface and metallurgical quality. An inspection of the photomicrographs, fig. 4, shows the greater uniformity of the diameter of individual grains when the metal is strip annealed. This feature contributes much to the superior quality of the annealed metal for cold working processes, inasmuch as too large a grain size causes rough surfaces (orange peel effect), while too small a grain size does not draw well. In addition, the strip annealer gives much greater uniformity from coil to coil than is possible with batch-type annealing and also greater uniformity throughout the length of any individual coil.

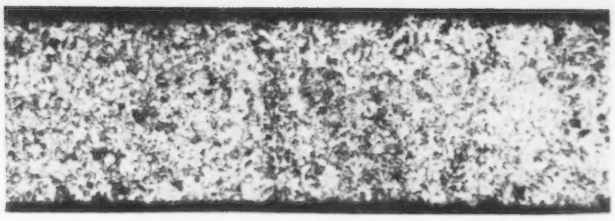
An interesting strip annealing operation is conducted at the General Plate Div., Metals & Controls Corp., Attleboro, Mass., where laminated metals are heat treated; combinations of precious metals on base metals such as silver, gold or platinum surfaces bonded on copper, brass, pure nickel, monel, or nickel silver; and base metal to base metal laminated combinations of two or more base metals such as nickel, monel, brass, nickel-silver, low carbon steel.

Strip as thick as 0.08 in. has been annealed, down to 0.001 in., widths ranging from 1 in. to 14 in. This installation has only two heating zones, both of which operate at the same temperature, ranging from 1400° to 1800°F.

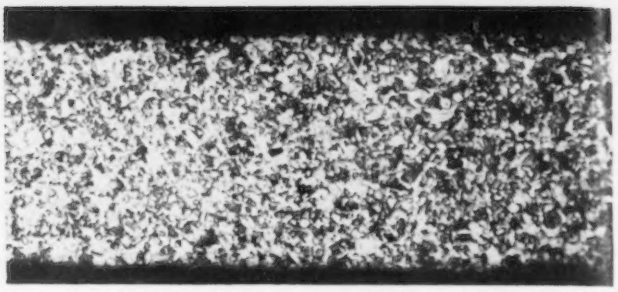
Annealing of thermostat metals (bimetal cladding) offers problems considerably more difficult than usually encountered with normal single metal or alloy materials, and special techniques have been developed to overcome these difficulties. Speed charts have been derived and pushbutton control installed so as to make possible the attainment of accurate speeds for various materials and thicknesses of materials.

The prime requisites of the annealing operation, hardness and grain size control, are said to have been realized, and here again pickling operations have been considerably reduced to one third of that formerly required prior to installation of the Drever furnace.

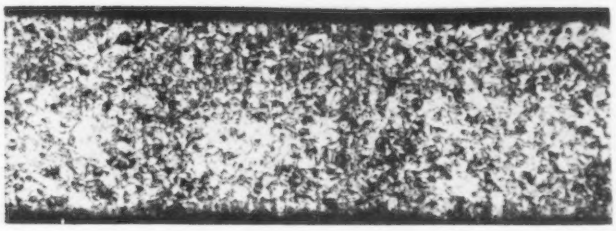
An interesting heat treating study was conducted by the Drever Co. on 70-30 cartridge brass strip 6 in. wide by 0.014 in. thick, using



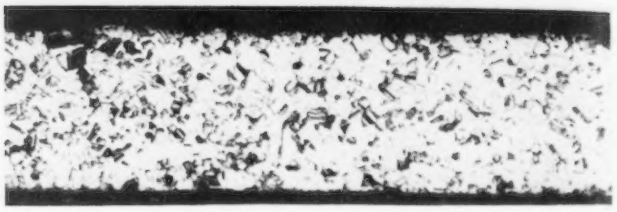
1100°F G.S. 0.010-0.015 mm



1100°F G.S. 0.015 mm

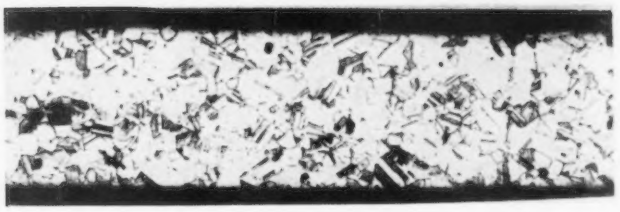


1200°F G.S. 0.010-0.015 mm

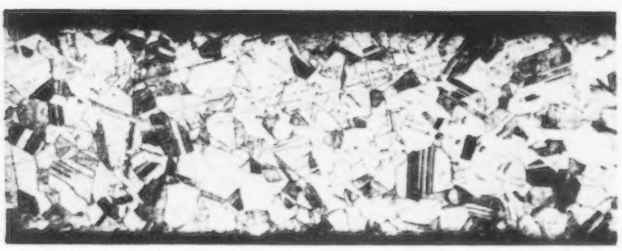


1200°F G.S. 0.025 mm

1300°F G.S. 0.030 mm

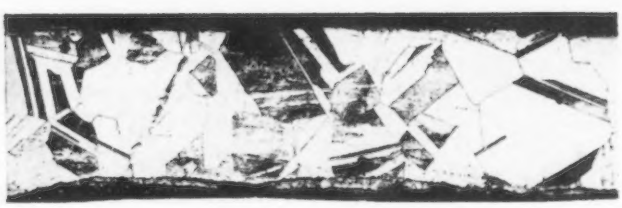


1300°F G.S. 0.040 mm



1400°F G.S. 0.045 mm

1400°F G.S. 0.085 mm



1500°F G.S. 0.120 mm

FIG. 5 — Time-temperature heat treating cycles performed in the vertical strip annealing furnace on 70-30 brass strip, 6 in. wide by 0.014 in. thick.

an experimental 15 kw vertical strip annealing furnace. In fig. 5 are shown the results of two series of time-temperature cycles, one series at 2 sec heating time per 0.001 in. thickness, and the other series at 3 sec per 0.001 in. thickness.

The photomicrographs speak for themselves in indicating the wide variation in grain size that can be obtained by either (1) varying temperature, with time kept constant, or (2) varying time with temperature kept constant. They also emphasize the greater uniformity of sizes of grains, within any one specified grain size, corroborating the results obtained at the Seymour Mfg. Co. (see fig. 4).

The ABC's of

Silver Alloy Brazing

By W. J. VAN NATTEN
Works Laboratory, General Electric Co., Schenectady

FIG. 1—In brazing this erosion shield to the turbine bucket, the silver brazing alloy shows up white against the brazed parts. An excess of alloy was used to form the correct contour between the shield and the bucket.

Fundamentals that must be observed in using silver alloy brazing as a joining method are outlined in this article, along with a description of the characteristics of ten well-known silver brazing alloys. Fluxing and heating are discussed, as well as joint design and part preparation.

THE increase in scope and use of silver alloy brazing in the past few years has been largely the result of numerous war applications necessitating the joining of metals in production quantities easily, quickly and with a quality bond. The evolution of this technique has resulted in confusion as to the differences between soft soldering, hard soldering and brazing. Pure tin has been referred to as a hard solder, and lead has been termed a soft solder. Brazing has been referred to as the joining of metals using brass or bronze as the filler metal. The present trend is to designate hard soldering as brazing and the use of tin-lead alloys as soldering.

There are a variety of brazing metals and alloys, including copper, spelter and bronze; silver and its alloys; aluminum and aluminum alloys; and gold, nickel and other metals. The most common brazing materials are the alloys of silver.

Silver alloy brazing is versatile, because low cost brazed joints are obtainable in small or large quantities. The low cost is attainable, however, only if the joint design is good, the proper brazing alloy and flux are used, and the most efficient brazing process is chosen for each particular application. Since an intermediate temperature range is required to silver alloy braze metals, this can be a decided advantage, since joining of certain chromium and alloy steels is possible without producing hard spots. This advantage is apparent in brazing such materials as the erosion shield brazed to the turbine bucket, shown in fig. 1.

Good joint strength can be obtained by silver alloy brazing. In most cases the joint can be so designed that failure will occur in the base metal rather than in the joint. Further, it can be accomplished simply and quickly by operators less skilled and with less training than those required for welding. This is illustrated in fig. 2, where brazing is accomplished by dipping wire ends into the brazing alloy and in fig. 3 where an armature coil connection is shown being resistance brazed using water cooled-block tongs. By making such operations more or less automatic, less operator skill is required.

Joining of many similar and dissimilar metals and alloys, such as shown in fig. 4, is possible by

FIG. 2—Brazing the wires on these small coils is simply a matter of fluxing and then dipping them into a pot of molten brazing alloy, requiring no particular operator skill.

brazing and frequently is not possible by welding. This applies in general to many nonferrous metals and alloys. Silver alloy brazed joints are excellent for vacuum and leak tight assemblies, such as bellows type thermostat assemblies.

A properly designed silver alloy brazed joint has an excellent appearance. Fillets can be made large or small by choosing the proper brazing alloy and flux, coupled with the correct joint design.

These brazing alloys are essentially a brazing spelter of about 60 pct copper and 40 pct zinc, modified by the addition of silver and other metals to obtain lower melting points, better melting and flowing characteristics, and increased strength. As most brazing alloys are heated, a softening temperature is approached, called the melting point. As the temperature is increased, these alloys become pasty and are in a state where both solid and liquid metal are present. Going still higher, a temperature is reached where they become completely liquid. This temperature is referred to as the flow point.

Eutectic alloys do not have this plastic range because of their composition. Their melting points and flow points coincide, and at a temperature lower than the melting points of other alloys of the same metals.

Table I shows some of the commonly used silver brazing alloys and a few of their characteristics. Alloy No. 1 can be used for joining iron, steel, and some nonferrous metals such as brasses that will not melt or become damaged at the temperatures required for brazing. It is a low-cost alloy, has good strength and malleability. It will not flow as freely as some of the alloys with a higher silver content, but is excellent when used for applications where the brazed parts are to be exposed to high temperatures or when subsequent brazed or soldered joints are to be made at lower temperatures.

The second alloy (in table I) flows somewhat better than No. 1, and at a lower temperature. This reduces the chances of damaging parts with excessive heat. It can be used in brazing iron. steel and nonferrous metals that have sufficiently high melting points to withstand the melting and flow temperatures of the brazing alloy.

The No. 3 alloy has a fairly wide plastic range and is a good general purpose alloy where clearances may be excessive. Large fillets can be obtained if required by the use of the proper brazing technique. Its lower melting and flow temperatures increase its scope of use with lower melting temperature base metals.

Alloys No. 4 and No. 5 have very low flow points, which, combined with good strength characteristics, make them useful in joining such metals as carbon steel, stainless steel, nickel, nickel alloys, copper and copper base alloys. Enlarged cross-sections of a brass to cast bronze joint made with one of these alloys are shown in figs. 5 and 6.

Strength where clearances may be excessive is possible when the low flow temperature No. 6 alloy is used. This type of alloy has found wide use in brazing tungsten carbides to other metals, and is an excellent alloy for brazing tungsten and molybdenum parts.

The No. 7 alloy is malleable, ductile and strong. Joints made with it resist severe shocks and vibration, and it can be used to braze any metals

TABLE I

Characteristics of Some Common Silver Brazing Alloys

Alloy No.*	Chemical Composition, Pct				Critical Temperatures, °F		Specific Gravity As Cast	Electrical Conductivity (Cu = 100 Pct)
	Ag	Cu	Zn	Other	Melting Point	Flow Point		
1	10	52	38	....	1510	1600	8.55	20.5
2	30	38	32	....	1370	1450	8.86	....
3	35	26	21	18 Cd	1125	1295	....	....
4	45	15	16	24 Cd	1125	1145	....	....
5	50	15.5	16.5	18 Cd	1160	1175	9.49	23.9
6	50	15.5	15.5	16 Cd, 3 Ni	1195	1270	....	....
7	50	34	16	11	1175	1425	9.37	24.4
8	72	28	00	00	1435	1435	9.95	77.1
9	85	....	....	15 Mn	1760**	1790**	....	....
10	15	80	....	5 P	1185	1300	8.45	10.0

*—These numbers are significant only in that they represent detailed description in the text of the article.
**—Approximate.

capable of withstanding the flow point temperatures of the alloy.

The silver-copper eutectic alloy, No. 8, has no plastic range. It contains none of the low melting metals such as zinc and cadmium. It is corrosion resistant and can be used for brazing copper, brasses and bronzes.

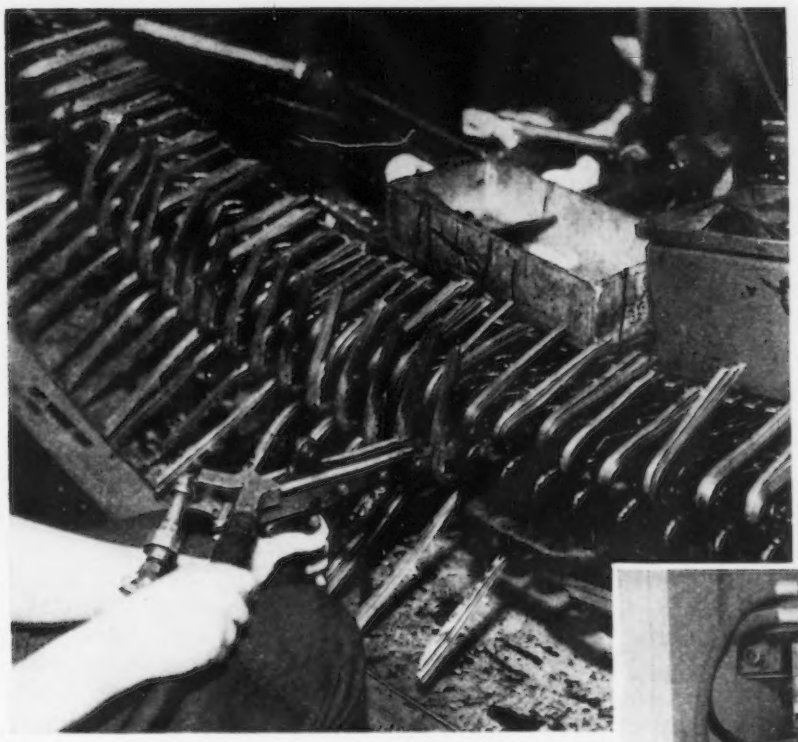
Alloy No. 9 was originally used in the German aircraft production. Its strength at elevated temperatures and its corrosion resistance enhance its use for brazing stainless steels where service is at elevated temperatures, such as heat exchangers, exhaust manifolds, and gas turbine sheet metal parts. Fig. 1 shows a brazing job for this type of brazing alloy.

The phosphorus in the No. 10 alloy acts as a flux when used in brazing copper and copper base alloys. It is not recommended for use on ferrous materials because the phosphorus forms brittle compounds with the iron. When used without a flux on copper, the heating time must be relatively fast. It is not as free flowing as alloys 4 and 5, and therefore must be preloaded whenever possible. It is one of the lowest cost silver brazing alloys.

Although the tabulation of silver brazing alloys represents only a few compared to the variety of those used, the wide choice of melting ranges and flow characteristics shown will meet most metal joining requirements.

These alloys are produced in a number of different forms, such as sheet, strip, wire, and filed or powdered form. Their ductility and malleability permit them to be preformed to desired shapes in order to fill the requirements of the application involved.

Fluxing is required in all silver alloy brazing processes. There are many fluxes on the market, which, with the proper alloy, make possible quality joints. These fluxes come in powder, paste, liquid, and vapor or gas form, and in some cases may be one of the constituents of the alloy itself, acting as a flux when melted.



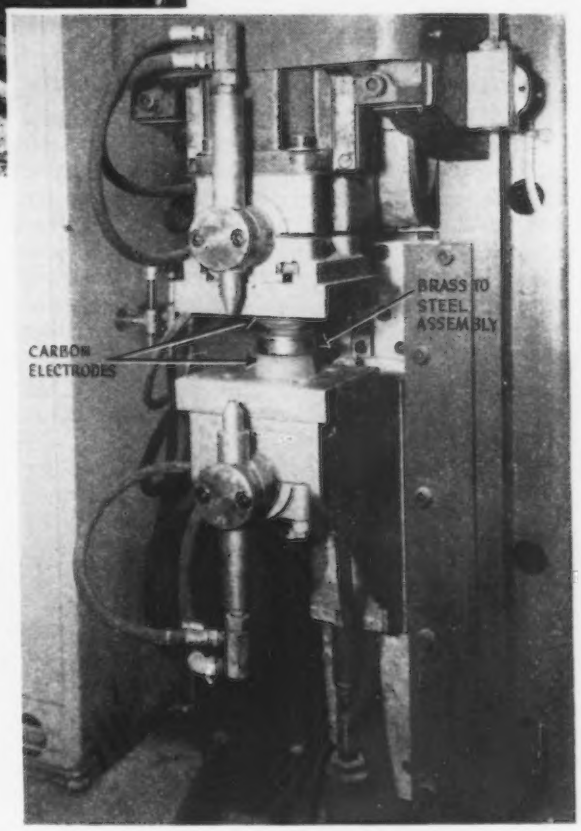
LEFT

FIG. 3—By using these water cooled carbon-block tongs, the armature coil connections of synchronous motors are resistance brazed. Such operations require less operator skill than welding.

o o o

BELOW

FIG. 4—By using carbon electrodes in the top and bottom platens, as shown here, brass to steel assemblies are easily brazed in this resistance brazing press.



Fluxes containing acid fluoride, water and other chemicals such as borates and borax or boric acid are usually made up in powder or paste form and may be any color.

A good flux, when properly applied, must cover and protect the surface at fairly low temperatures. During the brazing period it must also clean off and float oxides from the base metal, thus allowing the molten silver brazing alloy to

FIG. 5—This enlarged cross-section (10X) of a joint between brass and cast bronze using alloy No. 5 shows the clean, firm joint possible by brazing. The circled area is enlarged in fig. 6.

flow into and through the clean joint and wet the base metal.

A flux that protects the work properly for a low melting alloy may not be active enough when a higher melting alloy is used. Conversely, a flux that melts at a higher temperature than the silver brazing alloy may not protect and keep the surface clean when at the brazing temperature. Therefore, care must be exercised to choose the proper flux for each kind of brazing alloy.

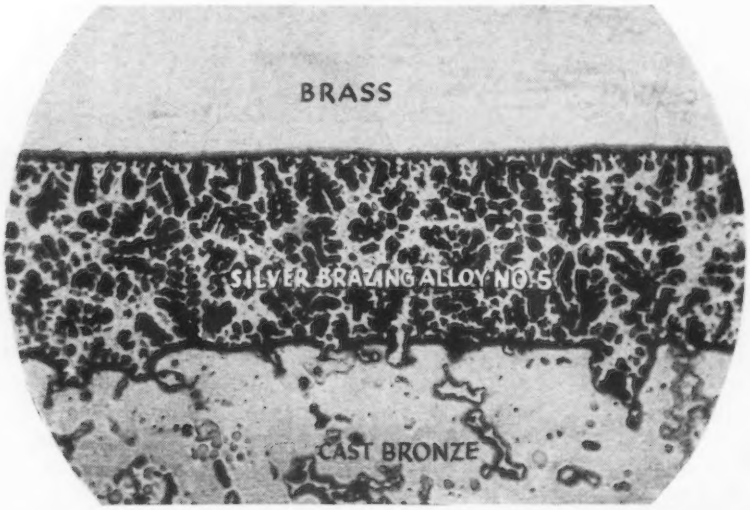
Fluxes also vary in activeness at the brazing temperature. One flux will keep oxides from forming when brazing copper, but when brazing an alloy steel containing chromium, a more active flux is required. For these reasons, it is essential to use a flux active enough for the base metal being brazed and also with a melting point that is adequate for the silver brazing alloy being used.

Joint design must be good. There are three general types of joints used in silver alloy brazing: Butt, lap and scarf. The joint clearance, an important factor, depends upon the brazing alloy, the base metal and the type of joint. A clearance of from 0.0015 to 0.003 in. is generally used when brazing with either alloy No. 4 or No. 5, but with alloys that do not flow as freely, greater clearances are required.

Parts to be joined must be free from scale, oil, grease, dirt and other foreign matter. Cleaning can be accomplished in several ways, depending upon the volume of production, the base metal being cleaned and the facilities available. Parts with only surface oil present can be degreased. Metal with heavy oxide coatings may have to be chemically cleaned or grit blasted. Where production is low, parts may be cleaned by using emery cloth or a file.

In fluxing the work, a powder flux may be sprinkled on the joint and the surrounding area. The brazing alloy is usually heated slightly and dipped into the powdered flux so that it adheres and protects the alloy when feeding into the joint. Some powdered fluxes can be mixed with water, alcohol or other liquids to make them stick to the work during brazing.

Paste type fluxes are probably the most versatile and can be used with practically any of the standard brazing equipment. Such a flux can be painted on the work with a brush or the brazing alloy can be dipped into it, forming a coating on the alloy that protects it from oxidation during brazing.



o o o

FIG. 6—To show in detail the bond between the brass and cast bronze joint, the circled area in fig. 5 is shown here at 250X.

o o o

Hydrogen is frequently used as a flux. It reduces oxides forming on the work and keeps it clean during brazing. Some other gases are used. However, where a gas is used which is only partially reducing, another form of flux, such as the paste or powder types, must also be used.

If paste or liquid fluxes are used, the parts should be assembled immediately after fluxing. Some joints can be designed so that they are self-supporting or self-aligning, while others may have to be supported by jigs or fixtures. This is important, since a correctly supported joint will have a minimum of strain during the heating and cooling cycle.

There are various methods of applying the heat necessary for silver alloy brazing. Most common involve the use of electrical resistance, torch, furnace, induction, dip and arc. Heating by resistance is shown in fig. 3, while high frequency induction heating is shown in fig. 7.

Each heating method has its own field of application. Some joints can be brazed by two or more methods of heating, the deciding factors depending upon those responsible for the work and involving a comparison of equipment available, the amount of production, and the cost of operating the equipment.

Regardless of the method of heating used, the fundamental requirement of bringing both members of the joint uniformly to the brazing temperature as quickly as possible must be met. Heat conductivity of metals being brazed is important. Copper, with high heat conductivity, will require most heat to bring it to brazing temperature than would an equal mass of low carbon steel. Also, where a joint is made up of a light section and a heavy section, more heat must be put into the heavy section to bring it to brazing simultaneously with the light section.

It is advisable to preload the alloy around the joint to be made so that hand feeding is eliminated. This is especially applicable where the joint is in such a position in the assembly that it would be impossible to hand feed the alloy.

Most fluxes used in silver alloy brazing are corrosive and must be cleaned from the assembly. Such cleaning can usually be accomplished by hot water or steam, and perhaps light scrubbing with a wire brush. Occasionally, quenching in water while the brazed parts are still hot will knock off the flux from the surface. In using this method, however, care must be taken that the parts have cooled sufficiently that stresses

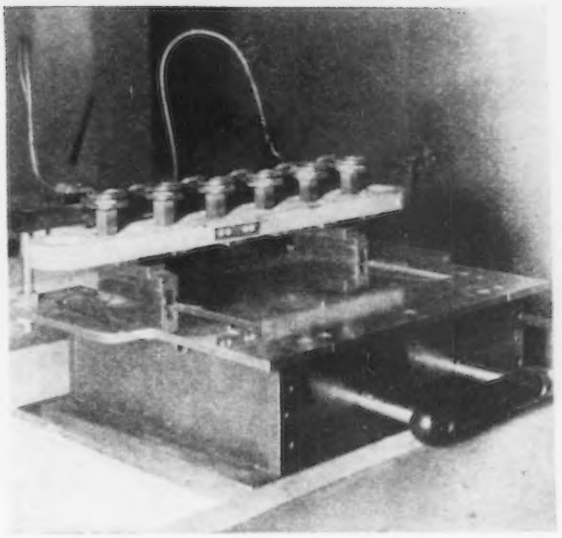


FIG. 7—The high frequency induction heating coils and fixture shown here are used for simultaneous production brazing of six separate steel assemblies.

set up by the quenching do not cause cracks at the joint or harmful heat treating of the base metal. Some fluxes cannot be removed by water washing and must be given a chemical dip.

Generally, the lowest melting brazing alloy that will fill the requirements of the job should be used, and always the proper flux for every job should be employed. Strong currents of air in the area of the brazing operation should be avoided as they may cause uneven heating. In cases where the brazing cycle is automatically timed, drafts may retard the heating and cause poorly brazed joints.

Deoxidized copper should be specified if any appreciable amount of hydrogen is present when silver alloy brazing copper to copper. Copper containing oxides may become embrittled if brazed in a hydrogen atmosphere.

When using a silver brazing alloy containing phosphorus, only nonferrous metals should be joined, since a brittle alloy results from the phosphorus-iron combination and the strength is appreciably lowered.

High nickel alloys, such as Nichrome, braze satisfactorily in the fully annealed condition. However, when under strain, the higher silver content alloys should not be used because they penetrate the base metal along the grain boundaries, causing cracks and breaks.

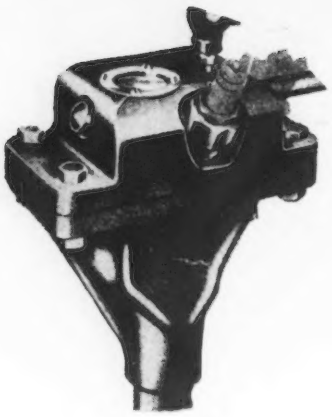
Concentration of Manganese from Iron Manganese Alloys

A PROCESS for concentrating manganese from low percentage iron manganese alloys into a sulfide-oxide slag melting at around 1970°F has been developed and is described in a paper published in "Jernkontorets Annaler."

The manganese rich equilibrium slags are produced by blowing the slag forming substances, containing sulfur and oxygen, up from the bottom of the furnace into the molten alloy. An optimum reaction interface is obtained by this method and the heat of reaction found sufficient to maintain the reaction in a going furnace.

Slag forming substances which are being used are sulfur dioxide gas, alone and with fine pyrite concentrate; pyrite concentrate blown in with air; and concentrates of pyrite and magnetite blown in with air or nitrogen.

The process yields slags containing 60 to 65 pct Mn, 16 to 18 pct S, 3 to 5 pct Fe, and about 3 pct SiO_2.



Gas Generator for

By J. M. HALLORAN
and
H. D. STODDARD
A. F. Holden Co., New Haven, Conn.

IN RECENT years, there has been an increasing need for some method of supplying fuel to furnaces located in natural gas service areas, where inability of regular systems to care for cold weather peak loads has forced the closing down of manufacturing operations from time to time. Numerous expedients have been tried, including accessory oil-burning equipment, petroleum gas auxiliary systems and complete auxiliary gas-producing plants. Because of the nature of standby requirements calling for irregular and intermittent fuel supply for only a few months out of the year most existing standby equipment is too unwieldy to be completely satisfactory.

The ideal piece of standby equipment would have the following attributes: (1) instant availability, (2) similarity of fuel supplied to natural gas, (3) ability to control furnace temperature and atmosphere, (4) minimum space requirement, and (5) maximum ease of installation and maintenance.

The device which comes closest to satisfying these requirements is a modification of the Reichhelm Gasifier. This Gasifier was originally developed for use with No. 1 fuel oil, but its capacity, using fuel oil, is too small to make it economical for standby use. However, with slight modification, it is suitable for use with gasoline, with a capacity increase of 600 pct. Since the availability of sufficient fuel is of primary importance in standby service, rather than minimum cost of fuel, the slightly higher cost of gasoline is more than compensated for by the greatly increased capacity of the Gasifier and consequent saving in capital expenditure. The Gasifier *is the only* gas producer which does not occupy productive floor space. It is instantly available at any time, maintenance is negligible and it is not in the way during periods when not in use.

The Gasifier discussed in this article consists of two castings assembled together to form a combustion chamber with spark plug ignition, fitted with baffle plates and properly located air and fuel inlets and gas outlet. Fuel is admitted through a valve which provides control of gas generation. The Gasifier is about 6 in. high, 4 in. long and 3 in. wide, and has no moving parts. Its capacity varies from a minimum of near zero to a maximum of 1.5 million Btu per hr. The unit may be installed with a minimum of difficulty, and it is not even necessary, in some cases, to shut down the furnace on which it is being installed. Since it occupies no floor space, there is no necessity for rearranging furnaces, tanks, racks, conveyors or any other equipment.

Mounted directly on the gas line to the mixer or manifold, the Gasifier takes up very little more space than a gas valve. The installation includes valves and switches so that standby service is available in a matter of seconds by closing one set of valves and opening the other set, then throwing switches to change over the automatic controls. The illustration in fig. 1 shows a typical installation with the Gasifier directly on the gas line, out of the way yet easily accessible.

To place the Gasifier in operation after the valves and switches have been properly adjusted it is only necessary to energize the spark plug and open the fuel supply valve. Since ignition of the mixture in the combustion chamber is instantaneous and the resulting combustion is selfsupporting, the spark plug may be shut off. The fuel mixture in the furnace is ignited and the fuel valve on the Gasifier adjusted, either manually or automatically to the desired rate of supply.

The internal operation of the Gasifier may be seen in the cutaway sketch in fig. 2. Fuel is admitted through entrance (1) and air through entrance (2). Air passes through channel (5) and into the stream of liquid fuel, causing a coarse spray to be formed at orifice (4). This spray is ignited by spark plug (not shown) and is directed and contained by baffle plates (6) and (7). Further air supply to support combustion is admitted at (3) in such a way at such an angle as to localize the area of combustion above baffle plate (7). Because the amount of air admitted to the Gasifier remains constant at all times, a constant amount of fuel is burned in the combustion chamber. All the fuel to be gasified comes in at orifice (4) and the gas passes

Standby Use

Alleviates Natural Gas Shortage Periods

The occurrence of winter fuel shortages during the past few years has caused many manufacturing plants to take steps to provide for such contingencies. A conversion unit suitable for use with gasoline is described herein, which possesses the advantages of minimum space requirements, low initial and maintenance costs, instant availability, and the ability to control furnace temperature and atmosphere. The authors describe the construction and method of operation of this device and indicate applications.

out at exhaust (8). Because of the constant flame within the Gasifier no carbon deposits accumulate. Although, there may be at times an excess of fuel over air of 20 times the proper amount for perfect combustion the operation of the Gasifier is unaffected because of the design and location of baffle plates and air inlets.

Control of furnace temperature and atmosphere is obtained with the same controls that govern the use of natural gas. Automatic operation is just as fast and just as accurate. Neutral, oxidizing or reducing atmospheres may be maintained.

The safety of furnace operation with the Gasifier is comparable to that of normal operation with natural gas. There is no possibility of fuel getting out of control because there is no room for an accumulation of either liquid or gaseous fuel. Liquid fuel remains at room temperature until the instant it is gasified, then the gaseous fuel is immediately sent on its way to the furnace. The rate of gasification of fuel in the Gasifier is always equal to the rate at which it is being burned in the furnace and is instantly adjustable.

In the event of liquid fuel getting past the Gasifier because of failure of the spark plug on starting, the liquid is removed through the condensate drain and returned to the supply tank. In case of power failure or failure of either fuel or air supply, the duplex safety shut-off valve stops supply of both fuel and air until proper conditions are restored. In case of a backfire from the furnace, burner into the manifold and back to the mixer, the operation of the Gasifier is not disturbed and the remedy for the situation is the same as if natural gas were being used.

The fuel recommended for use in standby service is clean white gasoline, medium or low grade. Any contamination such as sulfur compounds present in the gasoline is carried through into the furnace with resultant deteriorating effects on the material being heated. Since the gas produced by the Gasifier is composed of hydrocarbon mixtures similar to those which go to make up natural gas, it has qualities similar to those of natural gas. A fuel line pressure of about 10 psi is maintained by means of a pres-

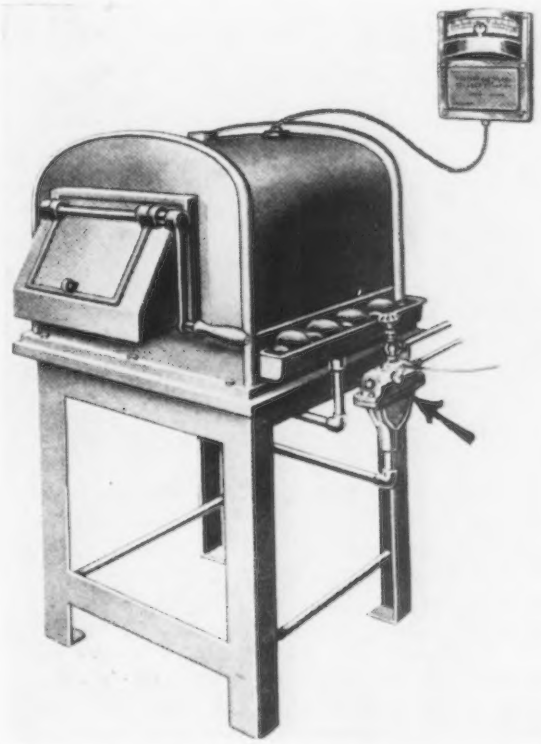


FIG. 1—A Gasifier unit (arrow) installed for use with an oven type furnace.

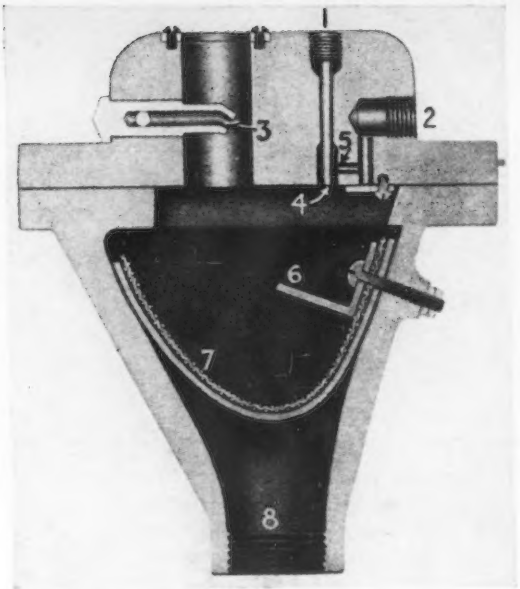


FIG. 2—Cross-section of a Gasifier unit showing principal parts and method of operation.

sure regulator. The fuel supply tank is normally located outside the building in a convenient spot. In case it is not convenient to locate the Gasifier right at the furnace where the gas is burned, the gaseous fuel from the Gasifier may be piped 50 to 100 ft, or more, if pipes are insulated.

Use of the Gasifier in standby service, as described above, does not, in any way, tend to eliminate the use of natural gas. On the contrary, it would tend to increase the year-round usefulness of natural gas by helping to absorb the peak demands and allowing the installation of more gas-consuming appliances to be serviced by natural gas during off-peak seasons.

Since the gasifier is primarily a source of fuel for a gas-burning application, the type of furnace in which the gas is consumed is of no importance. As an example, the furnace to be serviced might be a standard gas-fired salt-bath type having an inside pot dimension of 36 in. long, 24 in. wide and 24 in. deep, rated for high production at 1800°F. This furnace would have a maximum gas capacity of 1100 cu ft per hr of 1050 Btu natural gas. An installation of this type would require but one Gasifier unit for maximum productivity. A slightly different installation would be required for a battery of standard pot type furnaces with pot dimensions of 10 in. diam x 12 in. depth. Operating at 1650°F, these furnaces each have a gas capacity of 190 cu ft per hr of 1050 Btu natural gas. Accordingly, up to seven of these furnaces could be run at capacity simultaneously from one Gasifier.

An example of multiple installation would be a rotary hearth furnace 8 ft in diam, 24 in. deep. This furnace has a capacity of 3 million Btu per hr and can be serviced with two Gasifiers installed separately or manifolded together.

The discussion in this article has assumed that fuel pressure of 10 to 15 psi and air pressure of 16 oz would be used, because the majority of installations would have those services available. However, fuel pressure of 2 to 3 psi is entirely satisfactory and air pressures of from 6 oz up to several pounds per square inch may be used.

German Wartime Technical Developments

REPORTS of German practice in various technical fields of interest to engineers and executives in the metalworking field, issued by the Office of Technical Services, Washington, are briefly described below. Copies of the reports listed below may be obtained in either photostat or microfilm form. Orders for copies of these reports should be addressed to Office of Technical Services, Department of Commerce, Washington 25, D. C., giving the "PB" identification number.

o o o

Ilmenite Ore Smelting—Report describes the development of a smelting process for the separation of the iron and titanium content in ilmenite ore to produce a good quality pig iron and a titanium rich slag for use in pigment manufacture. *PB-78278; mimeographed $1.50; 53 p.*

Steel Casting Practices—Melting, molding and pouring techniques used in 18 representative steel castings foundries are discussed in this report. Heat treatments, mechanical properties, and analyses of the castings produced are included. *PB-1333; mimeographed $4.00; 149 p.*

Aluminum Refining—Data on aluminum refining, particularly on processes still in the laboratory or pilot plant stage of development, are contained in this report which supplements four other aluminum production reports previously issued. *PB-78264; mimeographed $1.75; 64 p.*

Magnesium Die Casting—Two reports describe the magnesium die casting techniques used by the Mahle Co., Bad Cannstatt. All parts were cast in hot chamber die casting machines with castings up to one lb made on piston machines and larger ones up to 13 lb on compressed air machines. *PB-1251; $3.25; 76 p. PB-1251-s; 25¢; 2 p.*

Aluminum Sheathed Cable—Report describes the processes by which the aluminum fabrication industry successfully used aluminum instead of lead sheathing on relatively large signal cables. Other practices described are the removal of magnesium from aluminum and the salvage techniques applied to the recovery of aluminum from scrapped aircraft. *PB-78274; mimeographed $1.00; 31 p.*

Fatigue Testing Production Parts

By C. B. GRIFFIN
Research Laboratories Div., General Motors Corp., Detroit

Fatigue testing of full size production parts appears, in many cases, to offer the most accurate, most economical and fastest method for evaluating shape and size characteristics and stress distribution. A fatigue testing machine that is said to meet most of the conditions of an ideal machine for fatigue testing full-size parts and assemblies is described in this article, both from the standpoint of construction and of method of operation.

FATIGUE testing is divided into two major classes; specimen testing to evaluate the fatigue characteristics of materials, and model or full-size parts testing to evaluate shape and size characteristics and stress distribution. In past years, the former method has been the more popular of the two. In recent years, however, more engineers have come to realize the best test of a machine is its service record. Since this method of evaluation is slow and costly, the testing of full size parts under conditions that are as close to service conditions as possible has been adopted by many organizations.

In some cases, it has been deemed advisable to test models. In these cases, dimensional variations sometimes cause a rather large error. Fabrication methods often differ to the extent that maximum benefits cannot be determined from model tests. The best results are obtained from production parts and sufficient stress analysis.

It was necessary, some time ago, to develop a connecting rod upon which the design of a new engine was to be based. To do this a single-acting machine was developed to alternate a load from zero to 40,000 lb at the rate of 2000 cycles per min. Through the use of this machine, a satisfactory connecting rod was worked out. This machine was further improved to give loads in push-pull and torsion, and was applied in the development of the Allison connecting rod. The first Allison connecting rod failed under a tension load of 12,500 lb, and a compression load of 25,000 lb in 200,000 to 2,000,000 cycles. Slight changes in shape with a small increase in weight improved this connecting rod, see fig. 1 (B), so that no failures occurred in 10,000,000 cycles under test loads of 20,000 lb tension and 50,000 lb compression. No failures were reported in service in the latest connecting rod. All this development work was done on parts made under production methods.

The ideal fatigue testing machine would be able to apply constant load to the part in the same manner maximum load is applied in service. Temperature conditions, when necessary, should be available. In order to meet all loading conditions, the machine will have to impart push, pull, twist and bending in the desired proportions to the test part.

A machine that meets most of these conditions has been developed at the General Motors Corp. Research Laboratories Div., and has the following specifications:

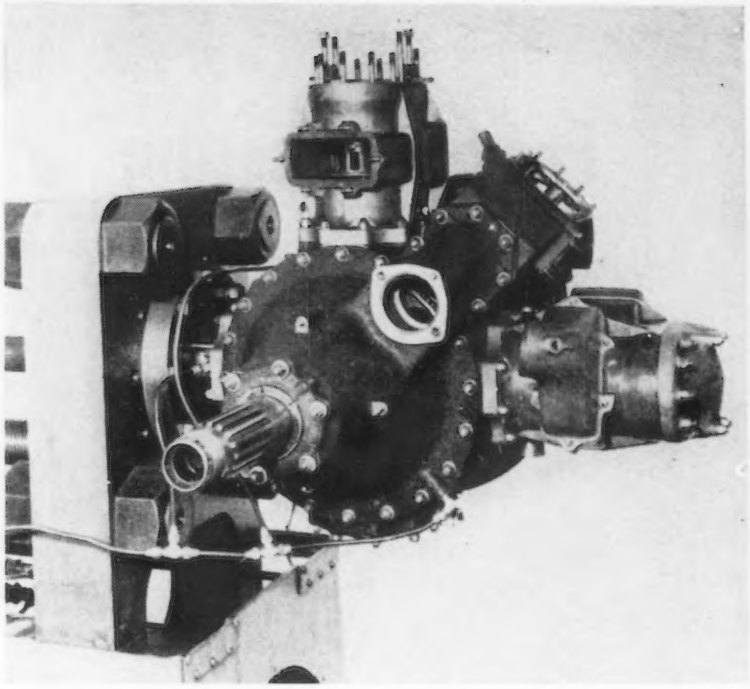
(1) A load capacity high enough so that parts may be tested at overload. Most of the machines in use have a 100,000 lb capacity, but this figure can be made as required.

(2) Any type load available such as (A) all tension (B) all compression (C) all torsion (D) any combination of the above.

(3) Torsion load up to 10,000 in.-lb can be applied in any desired phase relation to the tension compression loads.

(4) A dynamic stroke capable of straining most metal parts. Normally a stroke of 0.170 in. is furnished but can be increased if desired.

(5) A static stroke up to 2½ in.



A COMPLETE engine assimilating a power stroke on one cylinder, tested by General Motors Research Laboratories.

DIESEL piston tested for Detroit-Diesel Div. Compression load 45,000 lb.

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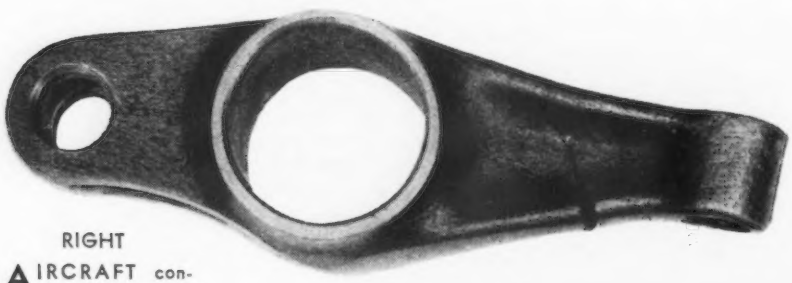

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AIRCRAFT connecting rod tested for Allison Div. Compression load 50,000 lb and tension load 20,000 lb. A similar rod was tested at 20,000 lb tension and compression, with a 1½ degree twist either side of neutral with the loads placed to peak together.

LEFT

ROCKER arm tested by the Chrysler Corp. Compression load approximately 4000 lb.

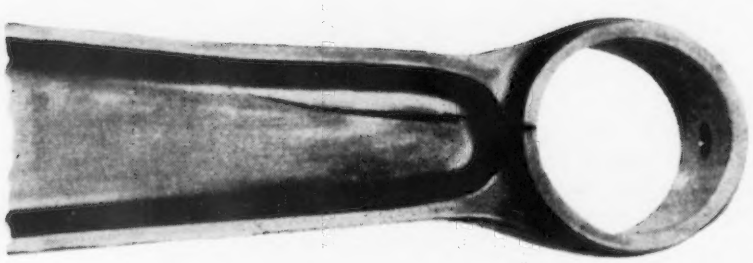


FIG. 1—Typical applications of fatigue testing for production parts evaluation and design change evaluations.

(6) A rate of load application up to 4000 cycles per min.

(7) A constant load during operation.

(8) Automatic features to allow continuous operation.

To accomplish these features a hydraulic system was developed through several models using the basic ideas until the present machine was evolved. During the war, several companies used these machines in development work in aircraft engines and other equipment.

A schematic diagram of the machine is shown in fig. 2. The principle used in this machine is the same as a hydraulic press. Statically, oil at high pressure is admitted to the loading chamber from a pump and controlled by valves; dynamically, the high pressure oil is supplied by a small diameter double acting piston to charge the chamber on either or both sides of the large diameter main loading piston. The amount of force on the test part is determined by the pressure built up in the loading chamber and the area of the piston.

The available stroke is determined by the selected areas of the two pistons and the stroke of the actuating piston.

Adequate fixtures for mounting the test part are essential if stress distribution in the machine is to be the same as in service. The main loading piston should be located near the center of its travel. This is accomplished by placing the reaction plate (bolster plate) at the proper distance from the loading cylinder. The reaction plate should be perpendicular to the line of action of the loading piston to eliminate any undesired bending.

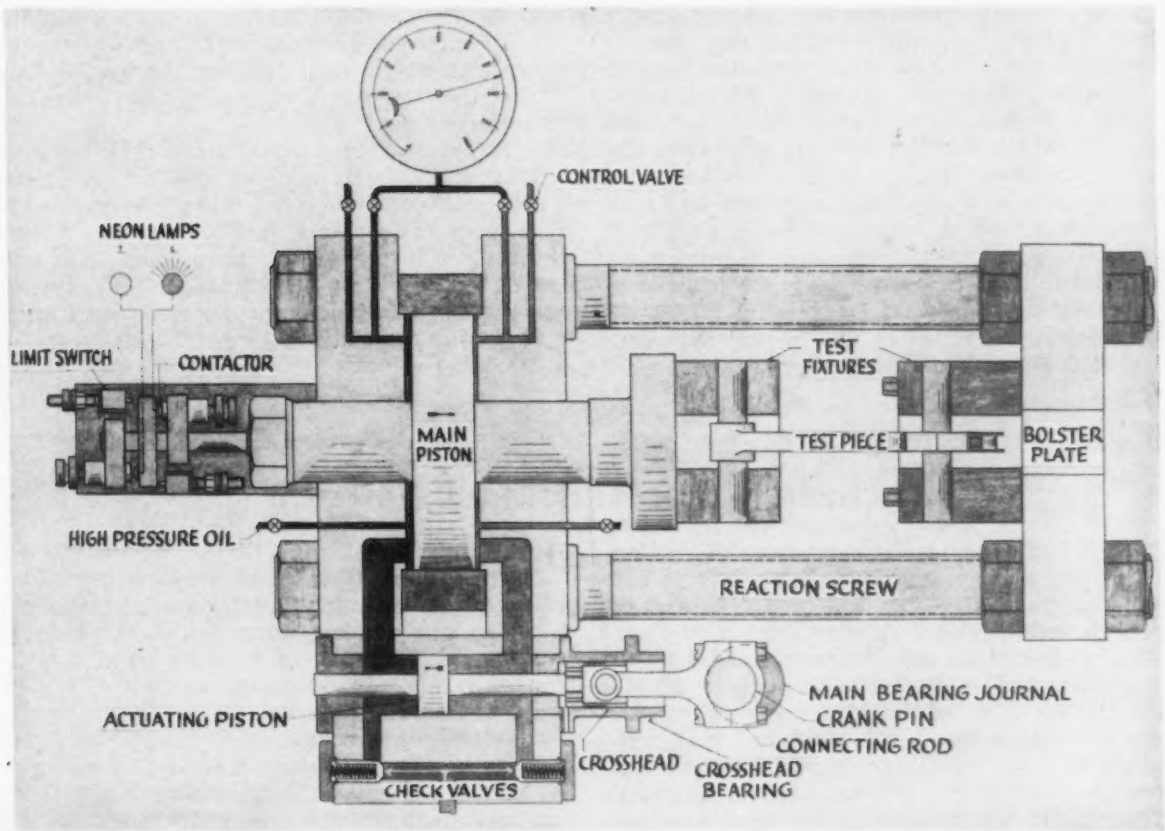
All loads can be applied either statically or dynamically. The loads are tensions, compression, alternate tension and compression, torsion in either or both directions or any desired combination of longitudinal load with torsion in any phase relation. Special combinations of any of the above load with eccentric column or bending load can be used with proper fixtures.

To illustrate the operation of the machine, a compression load on the test part will be considered: (1) Open load control valves on both loading chambers to atmosphere; (2) open the pressure gage valve on the left loading chamber (the gage should read zero); (3) slowly open the left high pressure oil line valve; and (4) slowly close the left load control valve. A pressure rise will be noted on the gage. Any load up to 100,000 lb can be applied to the test part (100 sq in. area of loading piston times oil pressure 1000 psi max). A micrometer screw, with electric contacts, measures the movement of the loading piston which is determined by the load applied to the test part. One point of the contactor is secured to the main loading piston rod and the other contactor point is secured to the cylinder head by a bracket on the left end of the test machine. It should be noted that these measurements include deflections in the machine parts as well as the test part. The machine was purposely made quite rigid to reduce its deflection. Load deflection curves can be drawn from data taken in this manner to determine if selected load is too close to the proportional limit.

In order to operate dynamically under the selected load, the contactor should be set to just flash the neon lamp, with the limit switches set at desired clearance while the test part is under static load. The load control valve is opened and the gage line valve and high pressure oil line valve closed. An actuating piston stroke is then selected 0.001 or 0.002 in. over the stroke indicated by the micrometer reading for main loading piston displacement, the main drive motor started, and the load control valve slowly closed until the neon light just flashes. The test part is now being loaded dynamically to the same load that was imposed statically. Until temperature equilibrium in the machine is reached, the load should be checked quite often since the expansion of the machine will change the point at which contact for the neon lamp should be placed. Tension load is determined in the same manner using the light loading chamber.

Alternating tension and compression loads are determined in like manner loading each side statically to the desired test load and measuring the total main piston displacement. Care should

FIG. 2—Schematic diagram of the fatigue testing machine.



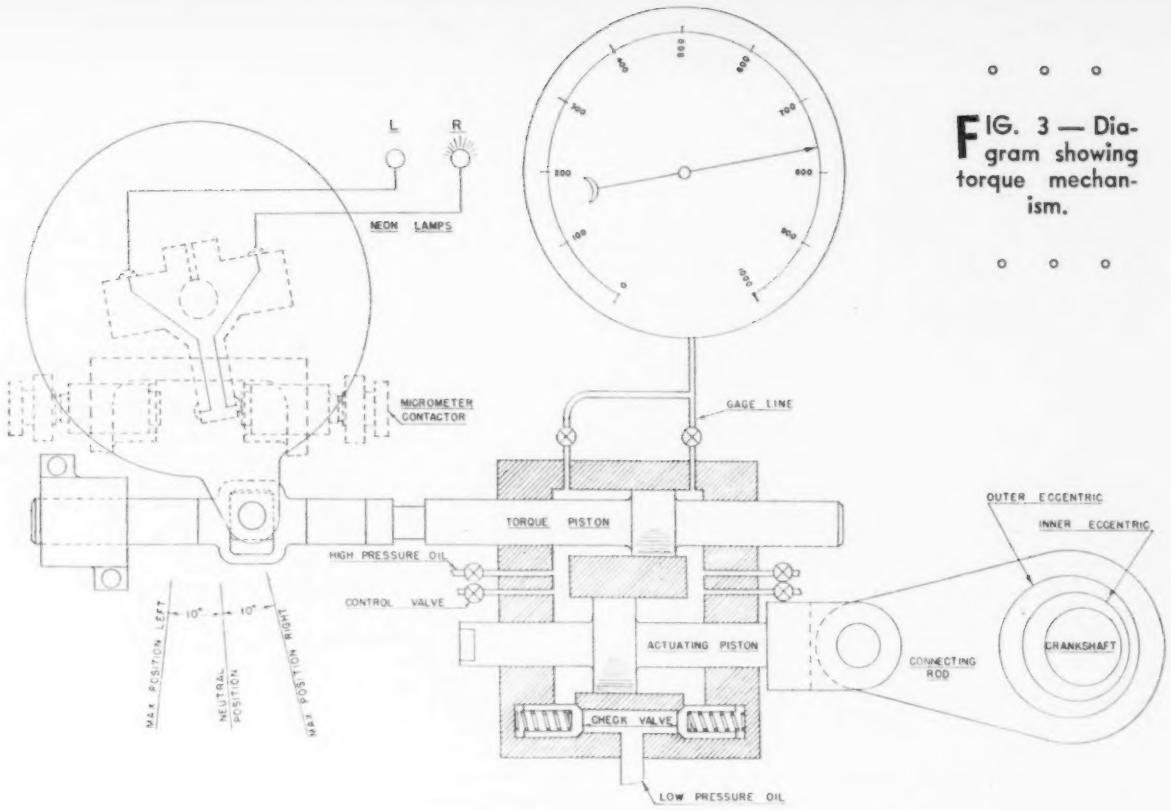


FIG. 3 — Diagram showing torque mechanism.

be taken to measure any piston travel due to clearances in test setup. Dynamically, a stroke is selected that is 0.001 or 0.002 in. greater than the total piston travel. The object of selecting a stroke somewhat larger than the static displacement is to allow for some "bleed" on the side under load. This makes it possible to maintain load even though the deflection may become greater. Too much bleed will cause the machine to operate with a great amount of noise and also lower the sensitivity of load control. If no bleed is allowed, the machine becomes a constant displacement machine instead of a constant load machine. The drive motor is started and both load control valves are closed slowly until both neon lamps just flash.

Torsion loads are applied in like manner to the tension-compression loads using the valves and drive mechanism on the torsion fixture to establish the desired settings, fig. 3. Normal operation is to dynamically load in tension and compression, then adjust load control valves on torsion drive to desired load. The torsion load can be phased to any desired relation to the tension compression load.

During the war, several organizations used these machines for production parts evaluation and design change evaluations. Since the war several automobile manufacturers have used these machines to check and develop new designs on several parts.

It is evident from work done on these machines that engine parts may be satisfactorily tested without hazard to other parts of the engine and in many cases cheaper and in less time. Parts failing in these machines leave no question as to which part failed first. By maintaining close observation, a fatigue crack can be detected at the beginning and watched to complete failure, if so desired.

Underwater Cutting Electrode

FOR surface and underwater metal cutting, a new electric arc electrode marketed under the tradename CutTrode has been developed by the Eutectic Welding Alloys Corp., New York. The electrode has an exothermic coating for focussing and intensifying the energy of the electric arc. One of the advantages claimed for the electrode is that it will enable making a relatively thin cut which can be focussed and controlled accurately. Furthermore, the metal around the cut itself is seldom heated to any great degree.

Either conventional ac or dc low voltage power sources can be used and no special techniques in handling the rod are required. At a recent demonstration, cast iron, stainless, aluminum and other metals were cut, and steel plate was cut underwater to demonstrate the effectiveness of the rod for such work as shipbreaking and underwater salvage. The rod can be used for all forms of metal cutting, gouging, chamfering, nicking, breaking and piercing.

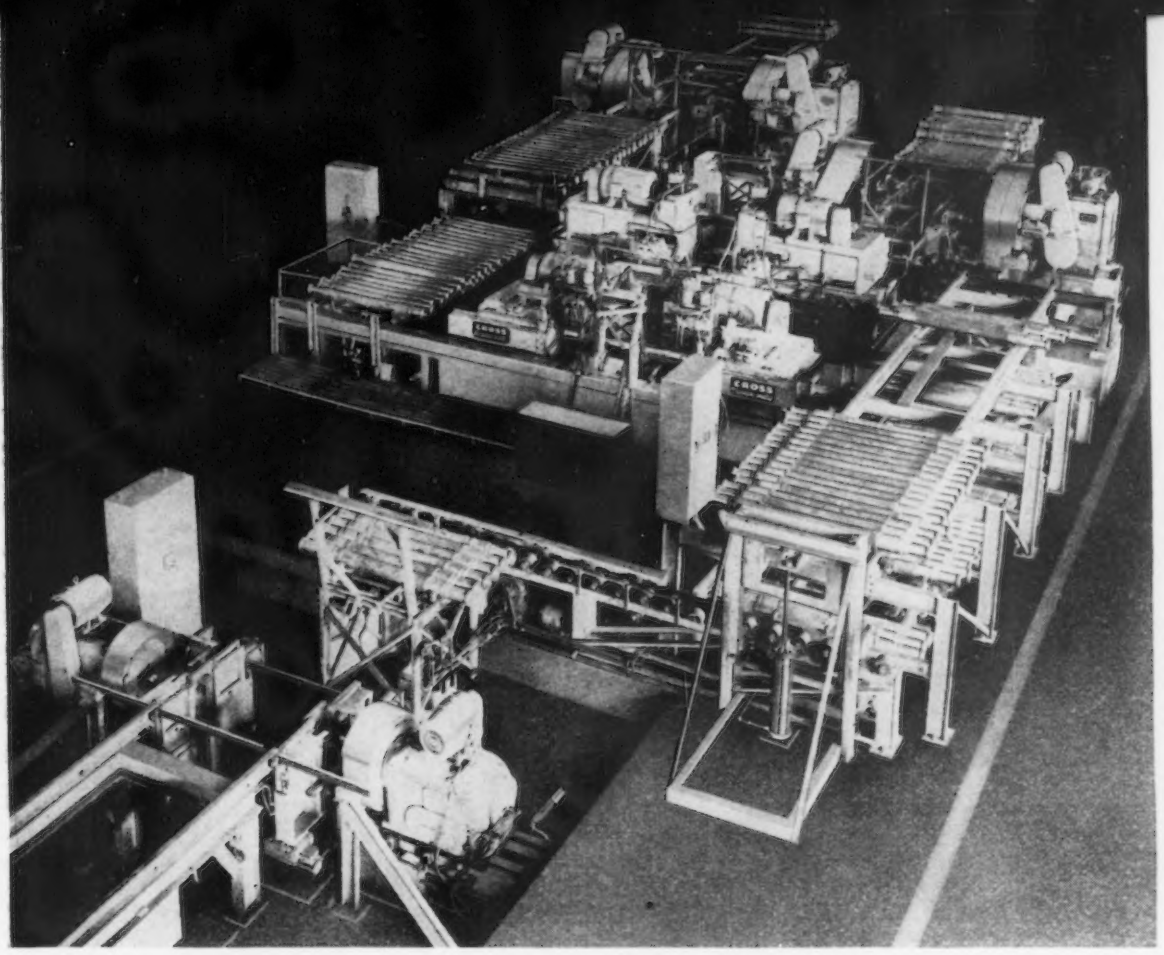


FIG. 1—The Transfer-Matic setup for producing railroad car axles. This setup is capable of producing 25 to 30 D size axles per hr.

Railroad Car Axles Machined Automatically

o o o

By WALTER G. PATTON

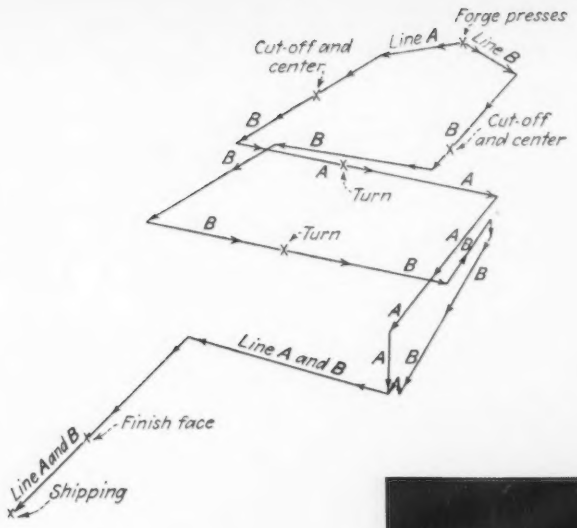
Detroit Regional Editor,
THE IRON AGE

o o o

A completely automatic transfer-type machine designed to crop, shear, machine and face railroad car axle ends is described in this article. Transfer, positioning and clamping of the axles in position for machining is also handled automatically.

TO speed production of badly needed railroad car axles, an unusual line of automatic transfer machines, called Transfer-Matics, for handling and machining automatically various sizes of these axles, has been designed by Cross Co., Detroit, and installed at Standard Forgings Corp., East Chicago, Ind. Now in operation, it is believed that this is the first time such a process has been accomplished automatically at such high speeds and feeds.

The two major problems involved in handling and machining these axles are the removal of the heavy crop on either end of the axle forging and finishing the ends of the axle. The crop, which is machined and then sheared off, frequently is as long as 6 in. and weighs as much as 45 lb. Since these axles are used for both replacement and for new railroad cars,



ABOVE

FIG. 2—This schematic diagram shows the work flow of railroad car axles from forging through cutoff and centering, turning, and finish facing operations to shipping.

o o o

RIGHT

FIG. 3—The sequence of operations on railroad car axles, starting, at left, with the rough forging.

conveyors moving at right angles to the work flow, which feed another conveyor that moves the chips to a 30 to 40 ton storage pit.

Crop ends drop down chutes on either side of the machine into large boxes that sit beside the machine on the floor. When these containers are full, they are picked up by a crane and the crops are dumped at a storage station. A centralized coolant system, located under the floor, supplies soluble oil and water to all of the machines for all machining operations.

Carbide tools are used throughout to provide the maximum cutting speeds and feeds. The construction of the Transfer-Matic is sufficiently rigid and the power supply is ample to permit optimum use of carbide tools. Hydraulic power is employed to position the work and feed the tools, and all clamping is pneumatically powered.

The present line of Cross machines will handle forgings from 3¾ to 10½ in. diam and from 5 to 9 ft in length, and production on the more popular D size axles runs between 25 and 30 per hr. This particular size weighs about 950 lb in forging form.

Cutting speeds and feeds are controllable, and can be varied from a dead stop to full speed. Axles are stopped in front of each machine, therefore machining time determines the length of the cycle. In practice, machining time varies over a considerable range, depending upon the type and size of axles in the machine.

The work flow through the machine stations is shown in fig. 2. There are five machines in the line, two cut-off and centering machines, two turning machines, and a finish facing machine.

The first operation is performed on a double-end two-station Transfer-matic which cuts off and disposes of the crop ends in the first station and centers the axle in the second station. Axles feed into the cutoff machines by a pick-off arrangement that is part of the machine cycle. The axle remains stationary and the

the radii at each end must be true and there must be a minimum of work hardening. In some cases a further light finishing cut is required, while in others burnishing suffices. The finish must be sufficiently good that the oiled textile waste used as packing in the journal box of the railroad car will not cling to the end of the turning axle.

Most of the axles produced at present have an analysis approximating SAE 1050 steel. As received for machining, the axle may be as-forged, normalized to a 180 to 200 Bhn, or water quenched and tempered to 250 to 260 Bhn.

The Transfer-Matic line consists of five machining units with connection conveyors, shown in fig. 1. Dual lines of double-end machines for cutoff, shearing, centering and rough turning and a single, double-end facing machine perform the complete machining cycle. Handling of the units from forged stock to finished axle is by automatic transfer, positioning and clamping equipment. Control of the line is automatic and once the forging is introduced into the line it is stationed, machined and transferred automatically.

Approximately 1875 lb. of chips per hr are disposed of through a system of chip conveyors. The chip disposal system consists of steel belt

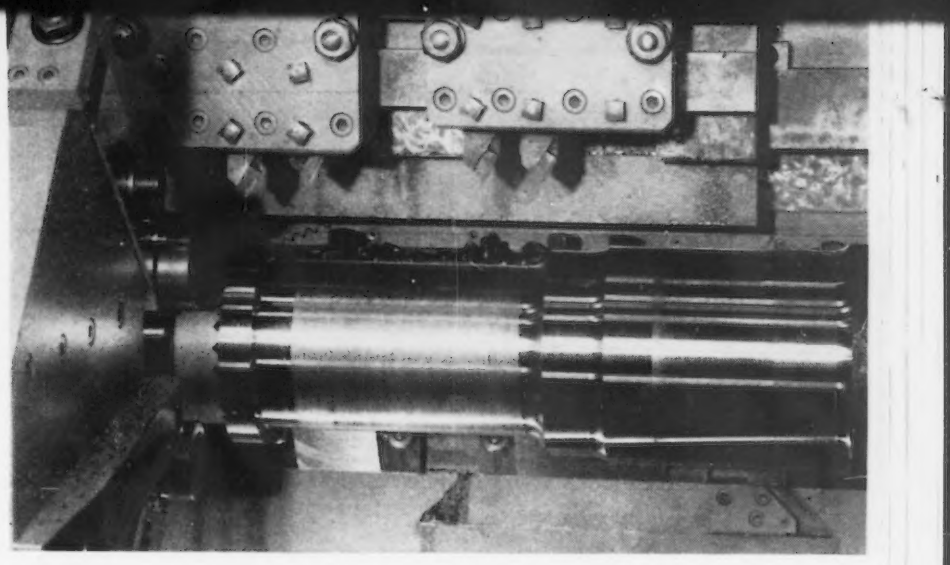


FIG. 4—Tooling detail for rough turning lathe. At the start of the cut, tools feed in diagonally to depth, then move straight across. Four tools feed in from the back to face the work and form the radii.

tools are rotated. Clamping, done pneumatically, is accomplished with self-centering V-jaws.

Two stubby tools, one at each end of the axle, first machine shoulders for uniform metal removal and steady cutting action of the crop and parting tools. The opposed carbide tipped parting tools, two at each axle end, cut a groove into each end of the axle, leaving the crop attached to the forging by a $\frac{5}{8}$-in. diam neck. The crops are then sheared from the forging with automatically advanced shears that enter the grooves cut by the parting tools. Fig. 3 shows the appearance of the axle after each machining operation.

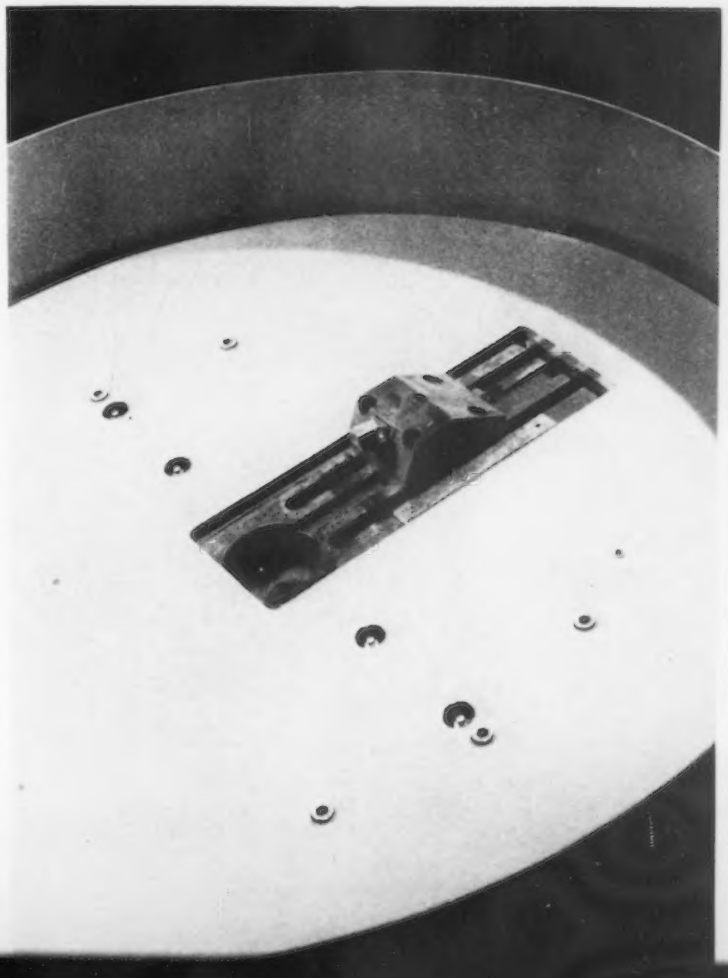
After shearing, the axle is released from the first station and advances to the second station. Here, the axle is centered in the conventional manner with rotating flat center drills, and then is ejected from the machine to a conveyor that carries it to the next machine for rough turning.

Two double-end automatic lathes for rough turning the end collars, the journals, the dust guards and the wheel seat diameters make up the third station, which is actually the second machine stand. These are single purpose machines and the work is handled only once. The axle rolls onto the table which transfers it to the loading position, where it is positioned into the machine. Here it is picked up by centers that advance through the middle of hollow friction pads. These serrated friction pads drive into both ends of the axle, gripping it firmly, and are the means of rotating the axle. Tools fixed in a downward position perform the turning operations, while tools advancing horizontally from the rear face face the shoulders and form the fillets at both ends, as shown in fig. 4. These axles are driven by 50 hp motors at each end. A single movement of the transfer carriage then removes the finished axle and positions a new one.

For the final operation a double-end machine faces the ends of the axles. This facing cut is made with a single point tool, shown in fig. 5, during which operation the axle is held stationary in a pair of V-clamps. The rotating tools at each end feed across the face of the work, finishing the axle to exact length.

Since this facing station has twice the productive capacity of the preceding operations, it has been arranged so as to handle the production of a double line of cropping, centering, and rough turning machines. The axles to be faced are fed from a loading chute which is supplied with axles from two turning machines. In the final operation, parts are ejected from the machine onto a conveyor, from which they are taken to be loaded for shipment.

FIG. 5—Tool arrangement for finish facing. The single point carbide tipped tool is fed hydraulically without intermediate mechanical linkage.



Micro-Spectrochemistry

A spectrographic microchemical analysis technique, applicable to the study of aluminum alloys, is suggested in this article. An interesting feature of this method is indicated by the author in his description of a procedure for studying diffusion in clad aluminum alloy sheet at thickness intervals of about 0.001 in., commencing within 0.001 in. from the surface. Simple, rapid and accurate, the method described can be readily performed with standard spectrographic equipment

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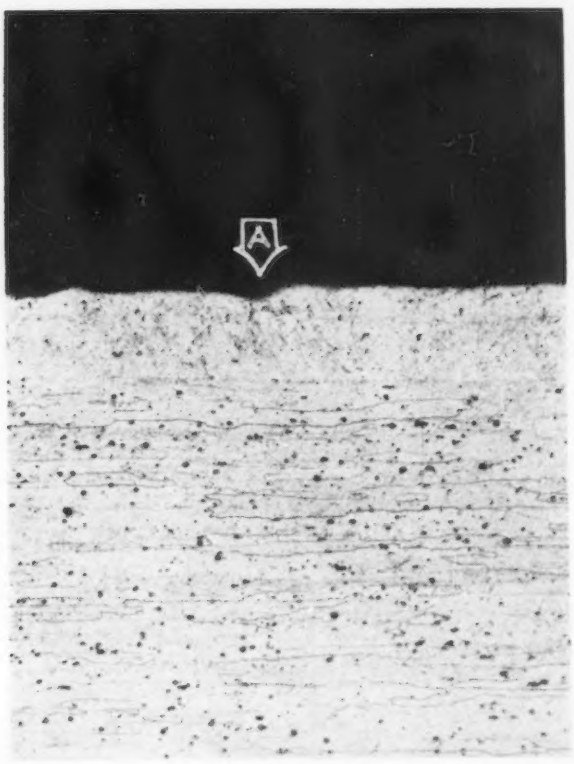
SPECTROGRAPHIC microchemical analysis (minute areas and depths) has received attention from several investigators. None, however, have applied their techniques to the study of aluminum alloys and those reported for use with steels have several deficiencies when applied to aluminum alloys and to the study of chemical contents near the surface of the stock.

Schiebe and Martin[1] were first to develop a test area as small as 0.02 mm diam (0.0008 in.). They obtained this small test area by the use of a very weak spark. If this weak spark were used with aluminum alloys the inherent lack of sensitivity would necessitate long exposure to yield a workable spectrogram. Because of the build-up of high dielectric aluminum oxide with long time exposure, it would be difficult, if not impossible, to maintain this weak spark. Schiebe and Martin also introduced a traversing mechanism on the spark stand to permit a continuous analysis across a test section of the sample.

Thanheiser and Heyes[2] obtained a small test diameter by means of a mica shield containing an 0.02 mm diam hole. This method would permit little improvement in sensitivity with aluminum alloys and would introduce an added alignment problem by the need for bringing the hole in the mica in line with the desired test area and with the counter electrode. No adequate means of measuring and regulating the interval between test spots was suggested.

FIG. 1—Cross-section through a spark crater area in 75ST Alclad sheet showing deepest crater A (0.00069 in.) as well as shallower craters produced by the selected 1-sec spark excitation. Etchant—Keller's modified. 100X.



Murray, Gettys and Ashley[3] made some alterations in the method developed by Schiebe and Martin but little increase in sensitivity was realized. Barker, Convey and Oldfield[4] made a marked improvement in sensitivity at the expense of test area with an enlargement from 0.02 mm to 0.31 mm (0.012 in.). Their technique did not employ a continuous traversing method but was confined to finite spot areas. Convey and Oldfield[5] used the more sensitive spark and its inherent larger area with the continuous traversing technique.

Controlling Test Spot Location and Traverse

The problem of studying diffusion in clad aluminum alloy sheet at thickness intervals not exceeding 0.001 in. and commencing within 0.001 in. from the surface requires a technique different from those heretofore reported. It was desired to control the spacing of the test spot by less difficult means than the traversing mechanisms mentioned, wherein all test spots were in one plane parallel to the depth of the specimen. The simplest method of accomplishing this result appeared to be by considering each test spot as a plane normal to the depth direction and traversing the depth by machining increments of 0.001 in.

Controlling the spacing of test spots by ma-

# of Aluminum Alloys

By D. P. JENSEN

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chining seems to be simpler than the use of a traversing mechanism and also to be more widely applicable since a milling machine is a more common tool than an intricate traversing mechanism adaptable to a sparking stand. With this manner of test spot control, the sparking excitation can be weak enough not to penetrate 0.001 in. in depth and a workable spectrogram can be produced not by long-time exposure but by superposed spectra from short-time sparking of numerous spots in the plane of one test area.

The Excitation Technique

Using an Applied Research Laboratories multisource unit and varying the sparking time and the electrical circuit conditions, various spark craters were produced and their maximum depths measured. Crater depth measurement was performed with a Bausch and Lomb research metallograph on perpendicular sections through areas previously examined on their surface with a binocular microscope to identify the deepest craters in a sparked area. A perpendicular section was taken adjoining the deepest craters and a metallographic polish was performed with intermediate observation on the research metallograph to establish the plane of maximum depth. Final measurements were made with a filar ocular.

A 1-sec sparking, without prespark, using an excitation of 2 mf capacitance, 50 microhenries inductance and 0.4 ohm resistance, produced a maximum crater depth of 0.00069 in. The one crater found having this depth, and shallower craters, are shown in fig. 1. Approximately 100 craters are produced by a single 1-sec sparking, with more than 90 of these craters shallower than 0.000016 in.

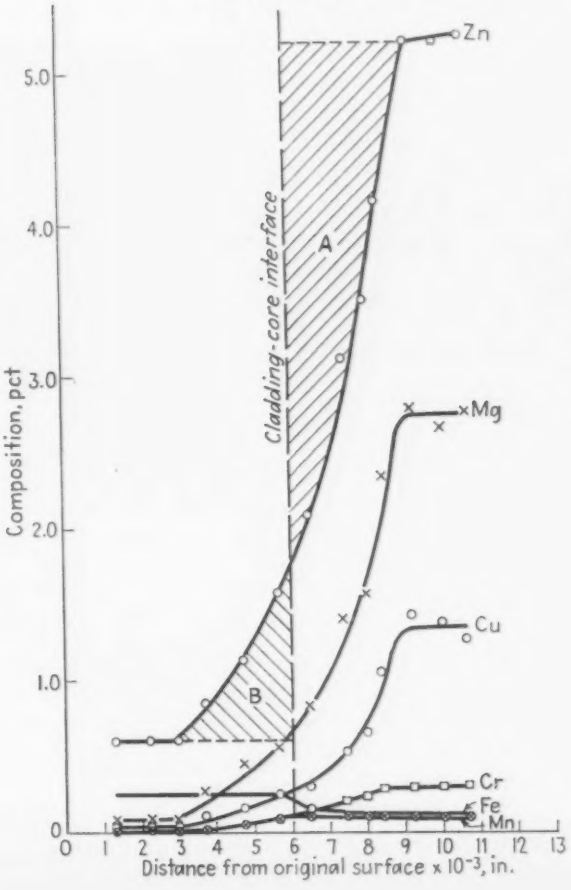
The superposed spectra from 30 such 1-sec sparkings produce an adequate spectrogram for accurate analysis of all elements present in aluminum alloys. Working curves for all elements were established using this technique with a series of standard samples.

Results with Aluminum Alloy Sheet

A specimen of 0.125 in. clad 75ST sheet, 2 x 4 in. in section, was securely attached to a 1-in. thick similarly sectioned block of aluminum with six screws to prevent warpage of the sheet during the machining of the required space intervals. The thickness of the assembly was measured with a micrometer and the surface of the specimen was milled to remove approximately 0.001 in. of thickness. The thickness was again measured, the 30 superposed sparkings were made and the cycle repeated to the number of test spots desired. The series of test spots was continued through the cladding and into the core until a constant core chemistry was established. A total depth of 0.0107 in. was thus examined in intervals of approximately 0.001 in.

Test results of all but the trace elements are presented in fig. 2. It is impressive to observe that all elements attain maximum core composition at approximately identical depths below the surface. The diffusion patterns for the principal elements are strikingly similar, as is emphasized

FIG. 2—Microchemical analysis in surface layer of a 0.125-in. 75ST clad sheet.



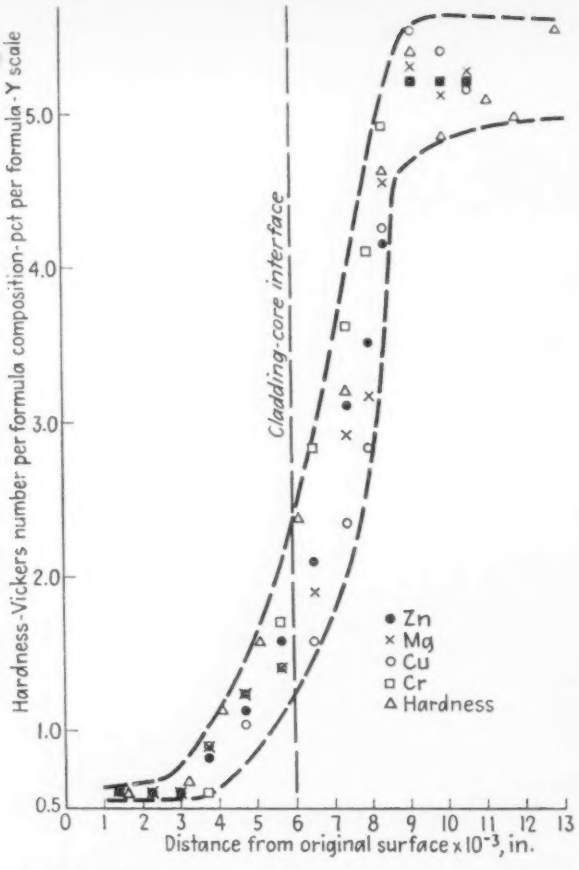


FIG. 3—Cladding-core diffusion pattern in a 0.125-in. 75ST clad sheet for hardness and elements zinc, magnesium, copper, chromium. Pct Zn = Y; pct Mg = 0.57 x Y — 0.25; pct Cu = 0.28 x Y — 0.14; pct Cr = 0.063 x Y — 0.028. Vickers hardness = 31 x Y + 22.4.

in fig. 3, wherein the composition scale for each element is altered to enhance the similarity of these patterns. Also included in fig. 3 are the results of a microhardness traverse which disclosed a marked correlation of hardness with alloy content. The hardness traverse was made with an Eberbach tester in two overlapping courses with indentations at approximately 0.002-in. intervals as illustrated in fig. 4. The cladding-core interface appearing in figs. 1 and 4, was established in figs. 2 and 3 as the average of measurements made in accordance with ASTM Standard Procedure B-209-46T-12(b).

A phenomenon indicated in fig. 2 meriting further attention is the difference in areas A and B. These areas are proportional to the zinc depletion in the core and the zinc pickup in the cladding, which together constitute the diffusion which took place during the heat treatment of the sheet. Corresponding areas can be located for the other elements. Thinking that the cause for this inequality may have resulted from the use of core stock whose surface is already depleted in zinc content (and other elements) as a result of prior processing, samples of unclad 75ST bar and plate were analyzed in accordance with the technique herein described. No surface depletion of zinc or other elements was observed in these specimens. It is hoped that other investigators may find an adequate explanation for the anomalous inequality of areas A and B of fig. 2.

This study of diffusion in the heat treatment of clad 75ST sheet was undertaken to establish whether a difference exists between 10 min solution time at 870°F and 2½ hr solution time at 920°F (both in sodium nitrate and both followed by 24 hr ageing at 250°F). Negligible differences were found between these two treatments given adjacent specimens from an annealed sheet.

The author wishes to express his appreciation to J. B. Bowen of this laboratory for his cooperation in performing the microscopic and metallographic work cited.

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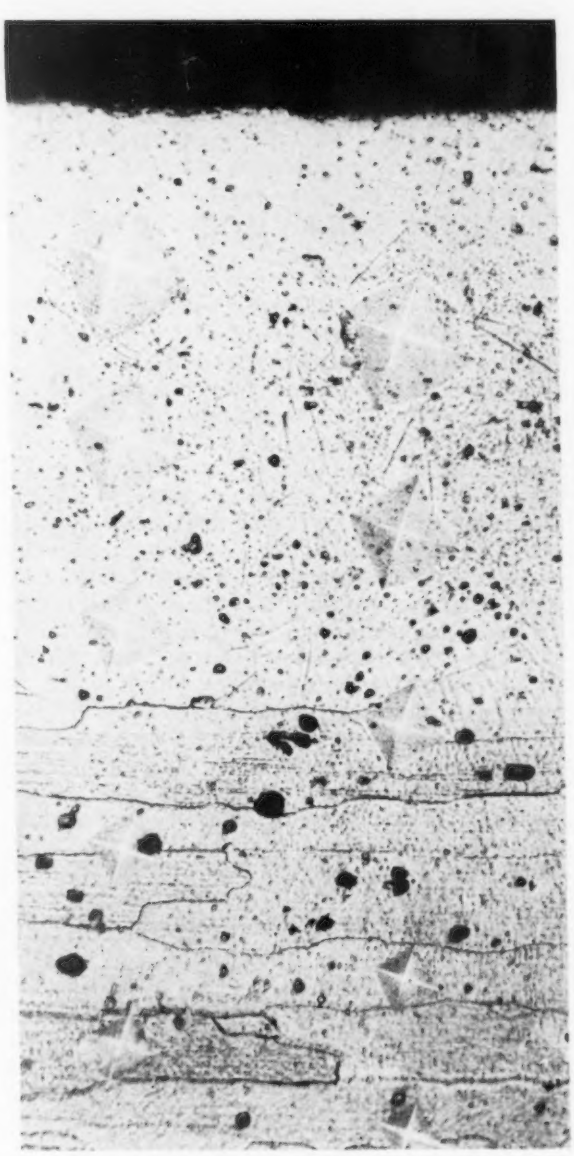


FIG. 4—Portion of microhardness traverse across the cladding and into the core, showing ten indentations. Etchant —Keller's modified. 500X.

New Equipment . . .

A rotary gear shaper having 10 individual and complete cutting units, a bar and tube cutting-off machine, centerless and vertical spindle grinders, automatic welder for welding and shaping light wire parts, multi-boring machines, an air gage for checking through-holes, blind-holes, and counterbores, a projection welder timer, and other machinery and shop equipment are described this week.

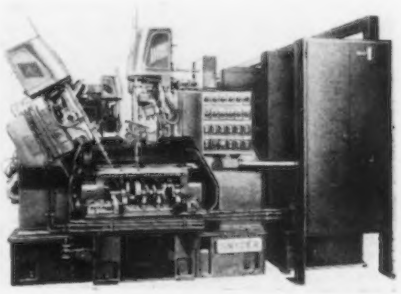
Rotary Gear Shaper

COMPRISING ten individual and complete gear cutting units, turret mounted on a single base, a rotary gear shaper has been placed on the market by *Fellows Gear Shaper Co.*, Springfield, Vt. Each unit is individually operated by a separate motor and electrical control, and stops automatically when the gear is completed. The entire machine is operated from a centralized push button control panel. Thirteen motors are used

on the machine. The individual saddles carrying the cutters are mounted on a saddle slide having a maximum vertical adjustment of 6 in. All 10 stations can be set up on a single gear, or can be arranged to cut different sizes and types of gears by allocating different numbers of stations to agree with the time required to cut the different gears. The machine is designed to carry cutters 6 in. pitch diam with 1¾-in. hole.

Special Drilling Machine

OIL holes in steel crankshafts are drilled at increased production rates, it is claimed, in a special automatic machine built by *Snyder Tool & Engineering Co.*, Detroit 7. The machine automatically indexes work pieces past a series of self-contained automatic



vertical, horizontal, and angular machining units which drill and deep-drill all oil holes, and drill and ream two welch plug holes in the cranks. Work pieces are loaded at one end of the machine and shuttled through 28 stations by an index bar. At each station, the work pieces are positioned and clamped automatically and drilled or reamed by hydraulically actuated machining units which operate in an automatic cycle initialed at a central push button station. Twenty-four Avey standard deep-hole units and eight horizontal units are employed. The machine has been designed to provide ample space at all stations for changing tools. Coolant is supplied from a central system. The machine is approximately 18 ft wide x 39 ft long.

Cutting-off Machine

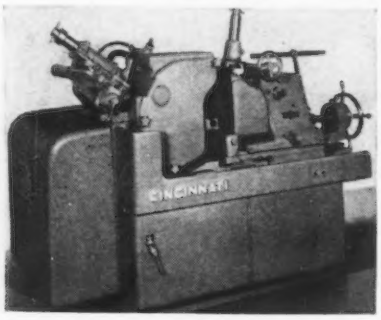
RAPID production is said to be obtainable on parts chamfered and cut off from tubing, pipe or solid bar stock, with the No. 35 Hydralectric cutting-off machine put on the market by *Bardons & Oliver, Inc.*, 1129 W. 9th St., Cleveland. Shock absorber cylinders and outer sleeves and work of similar nature also are well adapted to be completed in the machine. The stock is fed through the hollow spindle by a motor driven roller feed. A stock stop gages the length of the work. The two hydraulically operated cut-off slides, one front and one rear, are connected by an equallizing mechanism, reducing the cutting time to one half. The chamfering can be done either by a drop-off tool on the rear slide or by an overhead chamfering attachment actuated automatically by the front slide. A third or longitudinal slide can be furnished for parts requiring a boring, turning or drilling operation, or a combination of these operations. The collet chuck has a capacity of 5½ in. Either a

hinge or a spring type collet can be used. Main drive motor is 10 hp. Four spindle speed changes are obtainable by sliding gears in the drive transmission.

Centerless Grinding Machine

A NEW model Filmatic No. 2 centerless grinding machine has been announced by *Cincinnati Grinders Inc.*, Cincinnati 9. The units supporting the regulating wheel housing, upper and lower slide, are mounted on an intermediate plate which has a swivel adjustment through a trunnion mounted on the bed. A handwheel adjusts the upper and lower slides in relation to each other, or as a unit when clamped together. The dial incorporated in this handwheel has 250

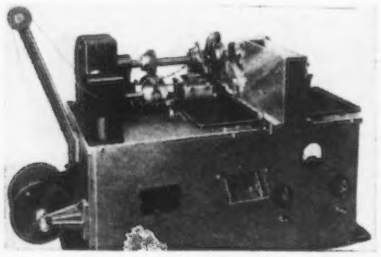
graduations. The grinding wheel spindle and regulating wheel are mounted on multi-shoe bearings. Main drive motor and V belts are protected by a sheet metal cover at the grinding wheel end. The motor



is mounted on vertical rails which are hinged to the bed at their lower end and provided with screw adjustment at the upper end for belt tension. Other design features include straight hydraulic grinding wheel truing with arrangement for cam controlled profile truing, if desired. The regulating wheel truing unit is manually operated and screw propelled. It may be replaced with a hydraulically operated unit, arranged for profile truing. Twelve speeds are available, from 12 to 300 rpm.

Automatic Welder

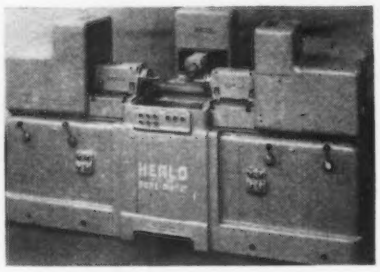
FOR welding and shaping of light, small parts difficult to process manually, a machine which welds automatically by means of an electronic welding and timing device has been developed by *Tweezer-Weld Corp.*, 1060 Broad St., Newark, N. J. Assemblies or small parts are fed to a turret either by hand or automatically from a hopper. The equipment is



said to be particularly effective in attaching light wire from a spool to parts fed automatically. Before or after the welding process, components can be shaped so that the welded parts, when they leave the machine, are ready for assembly into the final product. One of its uses is the welding of tabs to radio tube cathodes. The machine is rated at 3000 cathode assemblies per hour without the use of an arbor. It will handle round and flat cathodes from 0.020 to 0.125 in. OD, lengths from ⅝ to 2½ in. and tab wire as fine as 0.002 x 0.006 in. With adjustments, the equipment will also weld bi-metal strip to a two-piece lead, forming the bi-metal and cutting it to length.

Multi-Way Boring Machines

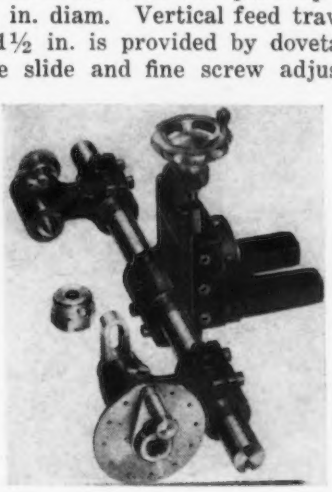
FURNISHED in two sizes as a Bi-Way, models 232 and 332, and in two sizes as a Tri-Way, models 233 and 333, Multi-Way Bore-matics have been announced by *Heald Machine Co.*, Worcester 6, Mass. These machines have been designed to bore two or more holes from various directions simultaneously. The combination of way units placed as desired, is said to provide for increased production and close accuracy for relative axial



location. Units may be operated separately if desired and up to three individual boring heads or a special multi-spindle head unit can be installed on each way unit. All the development features of the entire Heald line are included in the machines. Motor and pump are isolated from the base; improved idlers, cylinders, automatic way lubrication and refinements in hydraulics provide smooth and constant feeds. Like all Bore-Matics these machines are capable of boring, turning, chamfering, facing, grooving and fly-cutting operations.

Milling Attachment

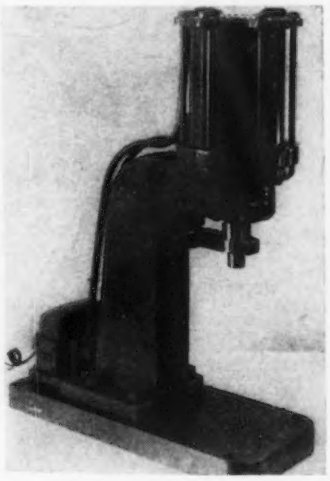
AN indexing milling attachment for performing milling operations on engine lathes has been developed by *Chicago Tool & Engineering Co.*, 8383 S. Chicago Ave., Chicago 17. The unit is said to cut gears, splines, keyways, oil grooves, slots, square shafts, hexagons, and flats on circular pieces. Work can be held between centers or in collet chuck. Model 300 will take work up to 4 in. diam and 11½ in. between centers when 18-in. supporting bar is used. The atachment will fit lathes with tool posts up to 1¼ in. diam. Vertical feed travel of 1½ in. is provided by dovetail type slide and fine screw adjust-



ment. Chuck with ½-in. capacity collet, tailstock center and one 12 hole indexing plate and arm are furnished with the No. 300 indexing attachment.

Small Arbor Presses

TWO air-operated arbor presses, Models M-1 and M-2, which feature an electric valve to eliminate manual valve operation have been released by *Hannifin Corp.*, 1101 S. Kilbourn Ave., Chicago. Model M-1 is equipped with a 4½ in. diam x 4 in. stroke air cylinder and develops up to 1270 lb ram pressure with 80 lb air line pressure. The air cylinder on Model M-2 measures 6½ in. diam x 6 in. and is said to be capable of delivering ram pressure up to 2650 lb. In both presses, the stroke can be varied to meet work requirements. Both are designed for bench mount-

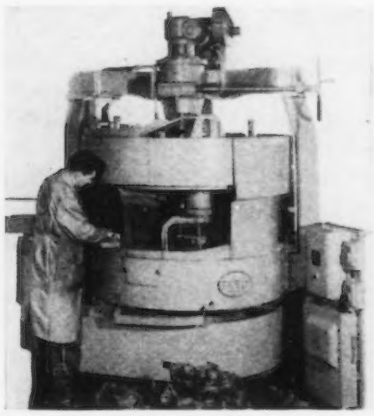


ing. In the M-2, built to accommodate larger work, the gap distance from table to ram up is 12¼ in. The gap is 6 in. in the M-1. These

presses are said to be especially adaptable to common press fit assembling operations such as in the manufacture of electric motors, small tools, and bearing parts. They are also recommended for light stamping, marking and die cutting operations.

Vertical Spindle Grinder

PRODUCTION on a new type 72-in. vertical spindle grinder designed for grinding cast iron gear housings, has been announced by *Chas. H. Besly & Co.*, 118-124 N. Clinton St., Chicago 6. The grinder features a power-driven rotary fixture into which the operator places the casting. Rotating fixture and revolving work holders carry the castings through the grinding cycle at one revolution



every 60 sec. Four pieces are ground simultaneously. Approximately 1/32 in. is removed. When smaller castings are ground, two or more can be placed in each work holder.

Air Gage

A NEW production air gage, the Compairator, weighing 12 lb, has been developed by *Taft-Peirce Mfg. Co.*, Woonsocket, R. I., for checking through-holes, blind-holes, and counterbores from ⅛-in. diam and external diameters down to 0.1875 in. diam. A dial indicator, graduated in 0.00005 in. increments, is positioned directly in front of the operator on a sloping face of the machine. Knob controlled tolerance indicators and zero adjustment afford easy control of the machine. Accessories include a universal gaging stand especially suitable for large plugs from 1½ to 3½ in. diam; a combination ID and OD fixture for simultaneously gaging internal and external diameters; and gage handles and hose for extension gaging. An air pressure regulator and air filter are built into the machine, and the machine can be attached to any ordinary shop air supply. The air supply pressure is not critical since the gage will function efficiently at supply pressures from 30 to 60 psi. The unit measures without mechanical contact, and can be used to check all dimensional variations such as taper, out-of-roundness, bell-mouth and barrel-shaped conditions. A simple and positive locking arrangement for gaging plugs or adaptors in the housing and in all attachments eliminates the use of wrenches. Repeatability in gaging is an outstanding feature made possible by the high-precision indicator mechanism, and flow of coolant upon the work, when gaging at the machine, will not affect accuracy.

Center Hole Gage

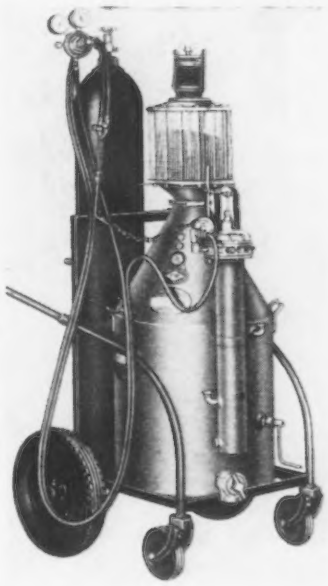
THE Center Master, an instrument for checking the size of 60° center holes, and also available for checking the sizes of 90° and 82° countersunk holes, is recommended by the manufacturer, *Veteran Machine Works*, 511 S. Laflin St., Chicago 7, for use in machining or grinding operations when locating from the center holes where the overall length and size of the center holes must be held to close limits. Diameter of center holes is registered by a direct indicator reading. When the gage pin enters the center hole it travels a given distance which is governed by the size of the hole. The indicator is a pre-determined distance farther from the fulcrum of the lever than the gage pin and travel of the gage pin is translated from a measurement of depth to a measurement of diameter. The indicator reading therefore gives the actual diameter of the center hole.

Spot Welding Timer

THE No. 52D Timatron, an electronic welding timer designed by *Ripley Co.*, Middletown, Conn., is said to assure uniform production in spot welding, giving precision control to flow of current in timing the weld. Once set for a particular thickness of metal, timing becomes automatic throughout the entire production run. Installation takes less than an hour, it is reported, and the control has the capacity to time any machine up to 10 kva. It is adjustable from 0.1 to 5 sec by a hand control covering any timing range which may be desired. Dimensions are 4¾ in. deep x 5⅛ in. wide x 9 in. high.

Acetylene Generator

RE-DESIGNED and improved carbide acetylene generators, designated model PS, are now available from *Sight Feed Generator Co.*, Richmond, Ind. Weight reduction of the visible supply feed hopper has been accomplished by the use of steel stampings. A sight feed safety check has been incorporated to stop all flashbacks resulting from improper operation of the torch. The units are supported on pneumatic rubber tires. These generators are available in four sizes; 30, 60, 125 and 250 cu ft per charge.



Time Switch

NEW design in an unusually small, compact time switch is being introduced by *Sangamo Electric Co.*, Springfield, Ill. Overall dimensions are 3 in. wide x 5⅜ in. high x 3 in. deep. Designated the Sangamo Type S, the time switch is powered by a newly developed high torque, synchronous, self-starting, low speed motor that is lubricated for life. The switch is designed for easy mounting on a standard switch box, or for surface mounting on any wall.

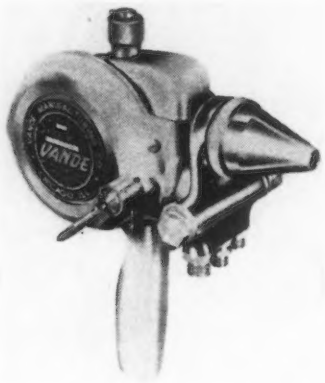
Flux-Coated Gas Rod

DESIGNED for all types of gray or alloy cast iron and to eliminate manual fluxing, a color-matching flux-coated torch welding rod

known as EutecRod 14 FC has been announced by *Eutectic Welding Alloys Corp.*, 40 Worth St., New York 13. The rod develops a tensile strength of 48,000 psi in the weld deposits, bonding at 950° to —1400°F, with a remelt temperature of 2200°F. Its coefficient of expansion is the same as that of gray cast iron, it is said, and its hardness is approximately 190 Brinell, producing welds that are machinable.

Metallizing Gun

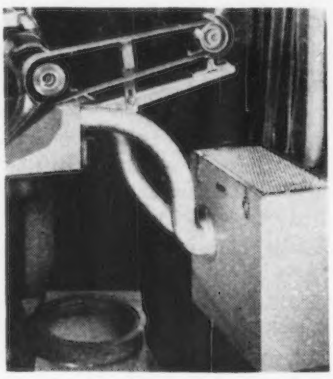
FEATURING a nozzle which mixes gas and oxygen at the point of combustion, a metallizing gun has been introduced by *Vande Mfg. Co.*, 1837 S. Michigan Ave., Chicago 16. The gun is said to completely eliminate backfire. Each wire nozzle is specifically designed to provide the exact volume for the gas used; acetylene, propane, or other gas. No air cap adjustments are needed. Another feature is the finger-tip turbine control. Positive turbine control is achieved by a compound turbine containing a



rotor and stator responsive to opposing propulsion fluids. The gun weighs less than 5 lb.

Grinder Dust Collector

MODEL 420 Dustkop dust collector consisting of a hood and two lengths of flexible metal hose for use when standard pedestal grinders are converted to backstand grinder-sander combinations, has been made available by *Aget-Detroit Co.*, Main St., Ann Arbor, Mich. The collector is a self-contained unit consisting of motor driven fan, cyclone separator, and a second stage filter for recirculation of cleaned air back to the working area. In conversion, the right hand grinder wheel and its hood are removed and a standard backstand attachment with a special hood is substituted. A 3-in. diam sleeve projecting from the back of the hood permits a slip-fit connection



with standard flexible metal hose. The dust outlet of the other wheel hood is connected with the flexible metal hose and both are fastened to the double inlet of the collector. The unit is portable.

Atmosphere Selector

ANNOUNCEMENT has been made by *Surface Combustion Corp.*, Toledo 1, Ohio, of a new selector for atmosphere gases which increases the effectiveness of the dew point recorder by enabling it to analyze consecutively atmospheres from as many as six different sources—generators, furnaces, etc.—in timed sequence. The atmosphere selector consists primarily of a six-way valve for six incoming atmosphere sources, motor, and electric time clock; so arranged that at a pre-set time the source of atmosphere supply to the dew point recorder is automatically switched from one line to the next. Pilot lamps on the control panel indicate the source of atmosphere being analyzed. A push button manually transfers the inlet valve

to the next station or source line. The frequency at which atmospheres may be analyzed for dew point is set by the large control dial.

Portable Puller

DESIGNED for lifting, pulling or stretching jobs, the Mighty Midget puller introduced by *Coffing Hoist Co.*, Danville, Ill., has a rated capacity of 500 lb with its chain having tensile yield of 2000 lb and its snap hooks a tensile yield of 3000 lb. A safety factor is a safety load handle designed to bend at 800 lb. Weighing only 6½ lb with chain, this midget puller features a two-way handle that can be used as a high speed crank or a ratchet lever. With the chain coiled up, the puller takes up less than a foot each way; fits into a small tool box.

Drying Barrel and Separator

DRYING small parts before and after electroplating is afforded by the combination steamheated sawdust barrel and sawdust separator, developed by *Belke Mfg. Co.*, 947 N. Cicero Ave., Chicago 51. The steam-heated barrel dries the work leaving it bright, clean and free from water spots, it is claimed. Steel ribs welded to the sides and bottom of the barrel assure positive tumbling action, allowing the sawdust to dry the work with a polishing action. Tilting the barrel emp-

ties the work into the separator. Operating the separator sifts the sawdust into the drawer below, leaving the work in the hopper which is then tilted to slide the work through the chute into a container.

Shop Tool Accessory

CALLED the Wizard Toolrak, a shop accessory which keeps tools in order and always available, has been announced by *Davis Development Co.*, 348-81 First National Bank Bldg., Colorado Springs, Colo. The rack consists of a variety of hardwood blocks which slide into a shaped aluminum back strip. The blocks are variously drilled, counter-bored and slotted to hold most of the types of small tools in commn use. Standard back strips range from 8 to 36 in. long and there are 31 different types of blocks.

WHEN

The process demands precise heating...

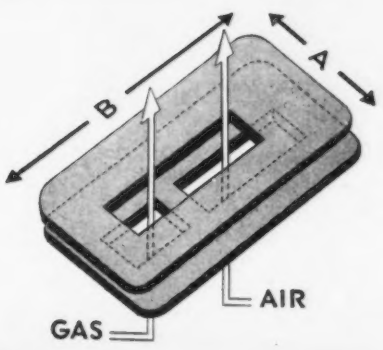
You need more capacity at the burners...

Economy forbids constant valve-twisting...

THEN

THE KEMP SLIDE-VALVE GIVES YOU SLIDE-RULE CARBURETION

You *lock* the fuel-air mixture where you want it. Then neither changing demand, nor random gas and air pressures, nor adjustment of furnace or burners, can keep the KEMP Slide-valve from the accurate completion of its appointed duty. Twenty years hence it's producing at the vernier setting on which you fixed it!



SEE HOW SIMPLE IT IS.. Upper slide with one port overlaps Gas and Air ports in lower slide. Fuel demand automatically moves upper slide in direction A-A to increase or decrease gas and air in precisely equal proportions. Manual adjustment by micrometer screw control and vernier scale in direction B-B adjusts proportion of gas and air. You lock it and there it stays until you change it. Simple! Adjustable! Fixable! A self-cleaner, too, and like the rest of the KEMP Industrial Carburetors it requires virtually no maintenance.

KEMP *of Baltimore*

PRECISION CARBURETION + ADAPTED COMBUSTION FOR INDUSTRY'S HEAT USING PROCESSES

ATMOSPHERE GENERATION & ADSORPTIVE DRYER SYSTEMS FOR PROCESS CONTROL AND PROTECTION

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Please send literature and specifications on your series S Carburetors.
We use gas-air combustion for_____

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Assembly Line . . . WALTER G. PATTON

• Auto industry hits its 1947 goal of 5 million . . . Olds 98 "Futuramic" will be the first "Big Three" postwar model . . . Replacements parts output triples the peak prewar rate.

DETROIT—On Dec. 30 the auto industry turned out its 5 millionth vehicle, thereby reaching its 1947 production goal and blasting into a cocked hat predictions made several times in this column that the industry would not assemble 5 million vehicles in U. S. and Canada during 1947.

This result was not accomplished without a struggle. It was expected that Chrysler would have a 2 weeks' shutdown for inventory. This prediction turned out to be more than 100 pct in error. Also, several auto companies were concerned about the flow of steel, particularly with Great Lakes undergoing extensive plant revisions. During the month Chrysler actually worked overtime to turn out a maximum number of vehicles. The shutdown of certain pickling equipment at Great Lakes originally planned for December was put off because of pressure from its customers. At the moment, no information is available as to whether or not any auto plants will be closed for lack of steel during January.

The Chrysler decision not to close for inventory apparently convinced other plant managers that inventory shutdowns were unnecessary or inadvisable at this time. During Christmas week all Chrysler divisions, Pontiac, Cadillac, Chevrolet, Hudson and Willys worked 4 days. GM assembly plants outside of Michigan operated on Friday.

However, Oldsmobile, Buick and GM Truck & Coach Div. shut down until the Monday after New Years, according to Ward's Reports. During the interim, Olds will be working on changeover to a new model and Buick is completing plans for introducing its torque-converter type of automatic transmission during January.

Kaiser-Frazer is taking its first complete inventory since production was inaugurated last year. Present plans call for reopening of the plant on Jan. 2.

This week will see the start of production on the first postwar passenger car to be introduced by the "Big Three." Oldsmobile is scheduled to go into production on Jan. 6 of its new "Futuramic" 98.

The Oldsmobile plant closed the day before Christmas and will reopen in less than 2 weeks, one of the shortest changeover periods in the company's history. The new Oldsmobile will have a new chassis, body, grille and bumpers. The powerplant remains unchanged and Olds will continue with its Hydramatic transmission.

A fairly large volume of sheet metal parts is said to have been shipped to branch assembly plants which will start assemblying the new models during January.

A "face-lifting" job has been done on Olds' regular line which will now be called the "Dynamic" series.

EARLY in January Buick plans to introduce its new automatic transmission. Those familiar with the new development seem highly pleased with the new transmission which will be the first torque-converter type automatic transmission in the passenger car field. Torque-converters are already being used on buses by White, General Motors Truck and others. Most automotive engineers feel the torque-converter type transmission will eventually be adopted by nearly all passenger car builders.

Present indications are that in the beginning the new transmission will be installed on only a limited number of Buicks in the Roadmaster series. It has been reported that initial production rate has been set at 35 units per hour. Most sources believe that extensive testing by Buick dealers in all parts of the country and under all driving conditions will precede any widespread distribution of the new Buick torque-converter in the hands of the public.

Unconfirmed reports this week indicate that the Ford automatic transmission program has had another setback. Meanwhile, the new Nash transmission is reported to be sufficiently advanced to permit its introduction with the new Nash models in the fall. Cadillac is known to have a new transmission which will probably be introduced with the new Cadillac to be presented during February or March.

Latest available information indicates that the automobile industry is turning out replacement parts at nearly three times the peak prewar rate.

Estimated wholesale value of replacement parts produced by auto manufacturers and the several

Wallen Named Umpire

Detroit

• • • Saul Wallen of Boston, Mass., has been named impartial umpire under the agreement between General Motors and UAW-CIO. He succeeds Ralph T. Seward, president of the National Academy of Arbitrators, who resigned to accept an assignment in the steel industry.

Mr. Wallen has acted as arbitrator for United Electrical Workers, CIO; United Rubber Workers, CIO; Textile Workers Union of America, CIO; United Textile Workers of America, AFL and New England Manufacturers. During the war he served as chairman of the regional office of the National War Labor Board, Boston.

MODEL 30H MAN-AU-TROL HORIZONTAL LATHE PRODUCES 3 IDENTICAL PIECES IN LESS TIME THAN NORMALLY REQUIRED FOR ONE

Meeting demand for lower production costs on between-center shaft turning work which calls for turning, grooving, facing and angle-turning, this new BULLARD Man-Au-Trol machine offers advantages never before found in horizontal lathes.

3 Identically-Tooled Spindles Cut Unit Costs

Turning out three finished pieces per cycle . . . with simplified tooling for rough and finish cuts, with Man-Au-Trol keeping tools cutting almost continuously . . . the BULLARD Model 30H Lathe not only outproduces three ordinary horizontal lathes but also reduces tooling costs.

Makes the Operator's Job Easier

The BULLARD Man-Au-Trol Horizontal Lathe has headstock and all operating controls conveniently located at the operator's right. Each of the three hydraulically-operated chucks is controlled by a foot treadle . . . leaving the operator's both hands free. Work and tools are always visible and easily accessible to the operator without reaching across tools or tool slide.

An Automatic All-Purpose Machine

Man-Au-Trol, *the automatic control that is as versatile as manual control*, makes this highly productive lathe an all-purpose machine. Quickly and easily changed over from one job to an endless variety of other jobs and convertible from automatic to manual operation at the turn of a single lever, it is practical for long or short runs.

Write for Literature

The unique combination of productivity, convenience, versatility and accuracy makes the new BULLARD Model 30H Man-Au-Trol Horizontal Lathe worth investigating. Complete specifications will be sent on request.

THE BULLARD COMPANY,
Bridgeport 2, Conn.

hundred supplying firms is $2.25 billion—equal to about 40 pct of the wholesale value of all new vehicles produced during 1947.

Assuming the price of replacement parts is double the prewar level, it is clearly indicated that the volume of steel being used in replacement parts today is much higher than the prewar requirements. This is one of several reasons why the total number of new vehicles built did not break all prewar records this year despite the fact that steel deliveries to the industry were in larger volume than during any other peacetime year.

OTHER significant changes are taking place in the automobile industry. For example, according to the Auto Mfg. Assn., during the past year 1.2 million new engines were built to replace the powerplants of vehicles on the road. Before the war the production of new engines for replacement was practically unheard of.

During the year 1941 the average age of all vehicles scrapped was 10.2 years; today 12 million vehicles have reached that age and are still running.

One reason why automobile manufacturers' inventories are large is that they must maintain parts for a very large number of cars in operation. For example, one manufacturer indicates stocks are being maintained of 225,000 separate parts which will fit cars up to 20 years old.

Before the war most dies were kept for about 7 years. When this period had elapsed, an "all-time" run was made and the die was destroyed.

Estimates of "all-time" parts requirements were upset during the war and many manufacturers have found it necessary to order new dies in order to maintain a satisfactory stock of replacement parts. According to automobile manufacturers some heavy losses have been absorbed by car makers because of the necessity for ordering new dies for replacement items.

Ford knows as well as anyone else that beating Chevrolet will be no easy task. Going into December Chevrolet production in U. S. plants aggregated 921,289. For the same period Ford, Lincoln and Mercury production in U. S. plants of cars and trucks was 920,420.

On Dec. 22, the millionth Chevrolet to be built during the calendar year was produced in the new Flint assembly plant.

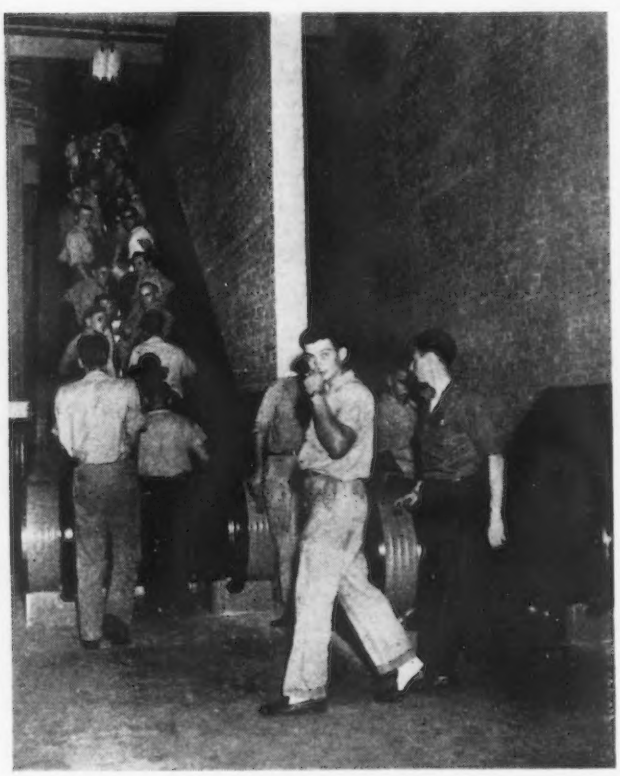
Looking toward 1948, Chevrolet is geared for production at an even higher rate, with two plants to be added during the year. First will be the new assembly plant at Van Nuys, Calif., to be opened in February. In addition, a new parts manufacturing plant is now under construction in Cleveland. The new Flint assembly plant was opened last July.

Chevrolet officials are currently looking forward to another year of full production even with the increased plant capacity. According to Chevrolet sales executives the present bank of unfilled orders is undiminished as compared with the start of the year 1947.

Continental Motors is adding a new 145 hp airplane engine to its line of powerplants for aircraft. This is the ninth model in Continental's line of horizontally-opposed aircraft engine.

According to Continental engineers, two airplane manufacturers plan to use the new C-145 in 4-place models scheduled for early public showing.

This is the second Continental aircraft engine to be introduced in 1947. The first was the C-90, the 90-hp 4-cylinder engine which is now being used by a leading aircraft manufacturer.



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LIFTING MORALE: *Buick employees are shown riding an escalator to their working stations after lunching in the new cafeteria which seats 2000 persons and is located in Buick's new sheet metal building at Flint, Mich.*

o o o

Subcommittee Named By Federal Research Board

Washington

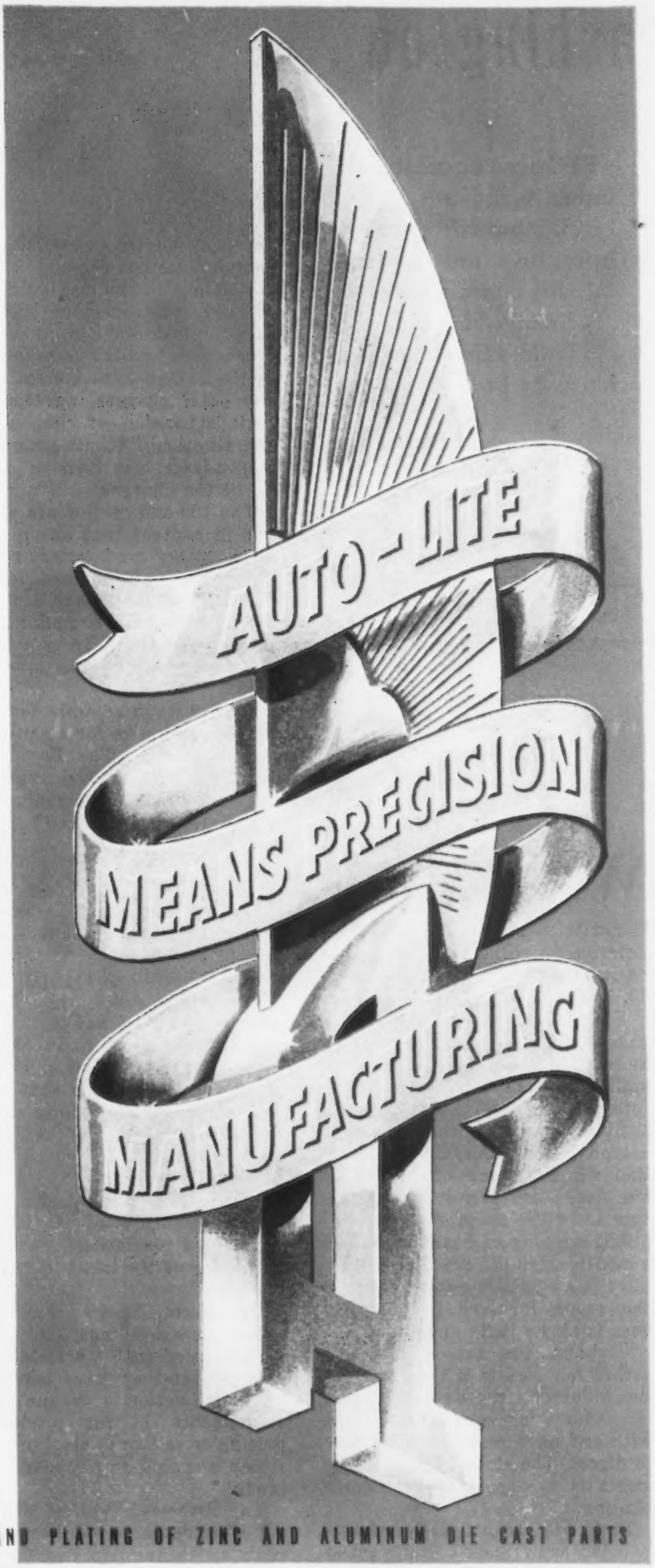
• • • **Establishment of** a new committee within the Research and Development Board, to be known as the Committee on Basic Physical Sciences, has been revealed by Dr. Vannevar Bush, Board chairman.

The new group will consider problems in the fields of fluid dynamics, metallurgy, physics, chemistry, and mathematics. It will then make recommendations as to the allocation or re-allocation of projects among the services.

In the field of metallurgy and materials, for example, the committee will study and direct research activities in the field of improvement of properties of metals, alloys and refractories along the lines of development of materials capable of withstanding extremely high temperatures.

Dr. W. V. Houston, preident of Rice Institute and prominent in OSRD work during the war, will head the group. Two civilians and two members each from the Depts. of Army, Navy and Air Force will comprise the committee.

Die Casting by AUTO-LITE



Manufacturers of a wide variety of products are benefitting from Auto-Lite die cast research and experience. Solid engineering, advanced casting methods, proper alloying practices and improved quality through "controlled metals" have made Auto-Lite a logical source of precision die castings.

THE ELECTRIC AUTO-LITE COMPANY
Die Casting Division
600 S. Michigan Avenue • Chicago 5, Illinois
723 New Center Building • Detroit 2, Michigan

Tune in the Dick Haymes Show for Auto-Lite
Thursdays, 9:00 P.M.—E.T. on CBS

CASTING, MACHINING, FINISHING AND PLATING OF ZINC AND ALUMINUM DIE CAST PARTS

Washington . . .

EUGENE J. HARDY

• FTC case against steel industry moving rapidly . . . Industry replies brief and unrevealing . . . All charges denied . . . Dismissal requested . . . Little affirmative defense by industry.

WASHINGTON — Speeding up its case against the steel industry, the Federal Trade Commission has set Jan. 12 as the date on which hearings will open on its amended complaint of Nov. 13, 1947.

FTC is moving a little faster than usual in this case for reasons known only to the commission staff. For example, the public relations staff of FTC was caught a little off guard by the refusal to extend beyond Dec. 22 the deadline for the filing of replies by the American Iron & Steel Institute and 101 steel producers.

The opening of hearings within a month after the deadline for replies to a commission complaint of the scope involved in the steel case is also a little unusual.

Perhaps, the reason for this rather fast action is the fact that the industry's replies have given the commission very little to work with and have required little time to digest. The stack of legal documents is a very dull afternoon's reading.

In general, they are all extremely brief, running only five to seven pages in length, and with few exceptions merely deny all charges of domination and manipulation of markets, utilization of the institute for maintenance of collusive agreements, collective agreements on the basing point system, extras and other charges, agreement to limit expansion of the industry and all other FTC allegations. All respondents also demand dismissal of the charges.

The 100-odd replies are so similar in content that one is left a little bleary-eyed after reading them. This coincidence led one FTC official to remark somewhat facetiously that "if nothing else, we may be able to prove collusive action in framing the initial replies."

AISI in its brief reply denies all charges and asks for dismissal of the proceeding. The U. S. Steel Corp., the first producer named in the complaint, filed a reply which is typical of more than 90 of those filed.

U. S. STEEL in its denial claims that "the amended complaint fails to allege facts which constitute a violation of Section 5 of the Federal Trade Commission Act" and further claims that FTC has no jurisdiction in the matter. In denying some of the price-fixing charges, U. S. Steel maintains that "price competition exists among all producer-respondents in the sale of their products." In regard to another FTC allegation, U. S. Steel denies that the NRA steel code has been continued in effect under the terms of a resolution approved at a meeting of the institute on June 6, 1935.

Bethlehem Steel's reply runs along the same lines, all charges being denied with a statement denying "that they have taken any collective action with any of the respondents in the production, pricing or selling of steel products which was or is in any respect unlawful."

The American Rolling Mill Co., added its denial of all charges and replying to another specific FTC allegation explicitly denies "that in July 1947, or at any time, respondent institute has been used to collusively support an increase in the price of steel which they or any of the producer-respondents had announced; and . . . that the separate committees or groups herein before referred to have at any time been used systematically or otherwise for the exchange and interchange of information among and between respondents and other producer-respondents, or any of them, to carry out a noncompetitive or any other type price policy."

AND so the replies run. The monotony is broken in only a few instances. An affirmative defense is offered by only two of the producer-respondents — National Steel Corp. and the Washington Steel Corp.

National goes into some detail concerning its pricing practices. It is pointed out in the reply that National "does not refuse to sell its products f.o.b. its plants, but is willing to do so for purchasers who desire to take delivery at the plants."

It is further claimed that when the customer is located nearer to one of its producing plants than it is to Pittsburgh, "National quotes delivered prices, which, except in infrequent and inconsequential cases, give the customer the benefit of the saving in transportation charges."

National also explains the competitive reasons for absorbing the cost of transportation of its products into distant market areas, but maintains that this practice is not used because of any agreement or cooperative action with any other producer. The reply claims that the above practices further competition, rather than curtail it for reasons that have been advanced by the steel industry for many years.

The National reply declares that its Great Lakes subsidiary "does not generally calculate its prices by reference to basing points, but, on the contrary, employs and has

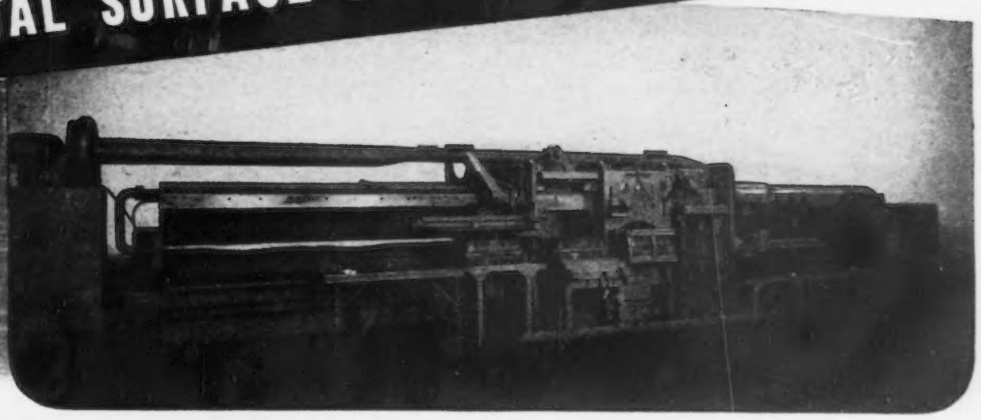
CINCINNATI

CINCINNATI Horizontal Hydro-Broach Machine for finish broaching cylinder head gasket surface.

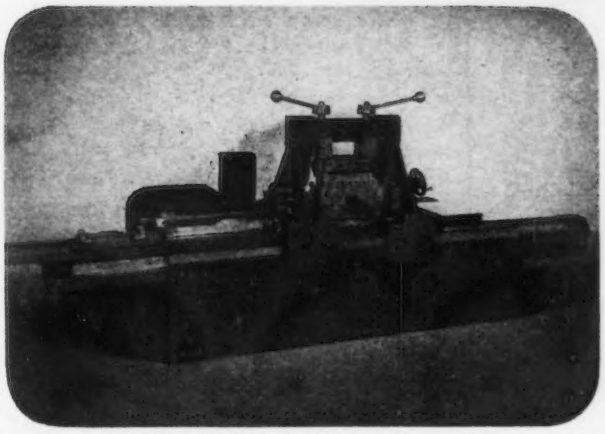
LOW HEAD ROOM AND LARGE PARTS

CALL FOR . . .

HORIZONTAL SURFACE BROACHING MACHINES



CINCINNATI Horizontal Hydro-Broach Machine for broaching five surfaces on cylinder blocks . . . half-bore, bottom, top, push rod and distributor pad surfaces.



CINCINNATI Horizontal Hydro-Broach Machine for finish broaching bearing locks.

● In many shops, the advantages of broaching can more readily be attained with horizontal rather than vertical machines. Three cases that might be mentioned are: 1) where there is not much head room, due to low ceilings or traveling cranes; 2) where ample floor space is available at low rental rates; 3) where parts are large and heavy. Of course there are other conditions, too, in any number of instances, and all of them have been met successfully with CINCINNATI Horizontal Hydro-Broach Machines. ¶ Three cylinder block installations are shown here. (Note: This type of broaching need not be confined to cylinder blocks and heads.) Our Application Engineers will be glad to study your requirements and recommend the most economical methods and equipment.

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES

employed its own distinct pricing method (in the Detroit area), which method applies to at least 75 pct of its total shipments."

THE Washington Steel Corp.'s explanation of its pricing practices follows much the same lines. Washington claims that it will sell its products f.o.b. its plant at Washington, Pa., but emphasizes that it must absorb any excess of actual transportation charges over the delivery charges included in the delivered prices of other producers in order to meet or quote below the manufacturers of similar products.

Other variations include the replies of the Continential Steel Corp., and the Cuyahoga Steel & Wire Co. These firms admit the existence and use by the industry of a "basing point" system of pricing.

The Pacific States Steel Corp. admits that until June 1946 it followed a "basing point" practice in the case of some of its sales but without any improper or unlawful intent. It maintains that it ceased any "basing point" practices after June 1946.

The Chicago Steel & Wire Co., provides a little variation by declaring in its reply that it is not a member of the institute and that "since the days of NRA it has been completely independent of the institute in all matters relating to prices, as evidenced by the fact that no representative of respondent has attended an institute meeting since 1935."

Bundy Tubing Co., in its denial states that it sells its products mainly tubing, on an "f.o.b., its factory basis."

So ends the first round of what will probably be a time-consuming fight between the steel industry and FTC.

Metallurgists Meet To Discuss Methods Of Metal Inspection

Detroit

• • • **Magnaflux Corp.** recently sponsored a two-day national conference here on the subject of inspection of high volume production. Metallurgists, men responsible for quality control and inspection from many U. S. industrial plants attended the meeting. The speakers represented a wide range of metal working industries. The meetings were designed to emphasize the savings that could be obtained through proper inspection programs which result in the production of fewer defective parts and lower production costs.

Mr. J. Manuele, quality control director for all Westinghouse plants, elicited much thought and discussion by his points on "Receiving Inspection and Sampling Methods." The use of reliable large quantity sampling inspection was described and its benefits shown for processes which are in control. "Under most conditions," Mr. Manuele stated, "a good sampling procedure will assure a more reliable product than 100 pct inspection, which might be done at too high a rate to be effective." "For products such as gas turbines, where no defectives can be tolerated, it is usually necessary to use 200 pct to 400 pct inspection to be sure nothing gets by."

Mr. R. L. Jackman of Chrysler Corp., physical laboratory, spoke on "Inspection Specifications." The subject of specifications between supplier and producer or between plant departments received added emphasis in other talks and in discussion from the floor. "Factors such as end use and economics of manufacture should be considered, and inspection specifications made specific concerning what shall and what shall not be a basis for rejection." "It is as foolish to say 'Inspect with Magnaflux' for a specification as it is to specify 'Heat-treat' on a blueprint without mentioning temperatures, type of quench, or hardness." Specifications should be intelligent and specific.

Mr. Clyde L. Frear, senior materials engineer of the U. S. Navy, Bureau of Ships, talked on "Inspection of Castings with Magnaflux." Salvage of castings and foundry control by use of inspection were discussed, as well as special inspection considerations for large castings.

Mr. L. A. Danse, supervisor of materials and processes, General Motors Corp., described some of his experiences in obtaining reliable and economical inspection through many years with the corporation.

Mr. J. E. LaBelle, assistant chief metallurgist of Detroit Diesel Div., General Motors Corp., described some case histories of parts found to be cracked by Magnaflux during production inspection.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

WAIT, ALEC, I'VE GOT TO SIT DOWN FOR A MINUTE OR SO.'
TH' BULL MAY BE BRAINY, BUT THERE MUST BE SOME FAT MIXED IN--HE LET TH' DOC TALK HIM INTO BIFOCAL SPECS, NEW FALSE TEETH AN' ARCH SUPPORTS, ALL AT ONCE!
HE'LL BE AS WORTHLESS AS A GUY IN LOVE WITH A GIRL WHO HAS TWO OTHER BEAUS, A LAP DOG, AND NO TELEPHONE!
TRASH
1-9
J.R.WILLIAMS
T. M. REG. U. S. PAT. OFF.
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THE OVERLOAD

11 YEARS IN SALT WATER

THE WELDED SPECIMEN, on the right, was part of a model gasoline tank designed for use with salt water ballast. Partially immersed for 4½ years in the polluted harbor at Newport News, Va., it was tested along with several other materials, and proved outstanding among the few that withstood this exposure without appreciable damage. After the Newport News tests, this specimen was continuously exposed for another 6 years, partially immersed in flowing sea water at Kure Beach, North Carolina.

Its companion specimen, made of the same alloy containing 70 per cent copper and 30 per cent Nickel, was similarly exposed at Kure Beach for 11 years. The rate of corrosion was the same for both specimens . . . only 0.0002" per year. These specimens are permanently displayed in the Inco Marine Test Station at Kure Beach.

Exposed to sea water for more than a decade, these two specimens show the remarkable corrosion-resistance of both welded and unwelded 70-30 cupro-Nickel alloy.

Welds . . . including butt, fillet and tack welds . . . performed as well as the rest of the alloy, reflecting its natural weldability and inherent corrosion resistance.

Although primarily developed for use in marine condenser tubes, this alloy is particularly useful for large diameter piping, water boxes, tanks, sheathing and similar forms.

It is strong, tough, and not susceptible to dezincification nor subject to stress corrosion cracking. It sturdily resists both pitting and erosion (impingement attack).

Full information is available upon request and we invite your inquiries.

EMBLEM OF INCO SERVICE
TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes and other alloys containing Nickel. This information is yours for the asking. Write for "List A" of available publications.

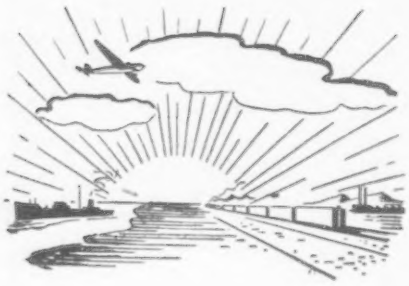
THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET
NEW YORK 5, N. Y.

West Coast . . .

ROBERT T. REINHARDT

• Western steel makers hang up capacity, or better, production records for 1947 . . . WAA gives nod to low bidder on Kalunite plant . . . Radical labor loses ground in Utah and Nevada.



SAN FRANCISCO — Western steel producers last week had every reason to be proud of the productivity of their furnaces and mills during 1947.

Without exception, the western steel companies reported shipments of finished steel at rated capacity or considerably in excess of those quantities.

An all-time annual record of finished steel shipments—surpassing even the peak productivity of war years—was hung up during 1947 by Columbia Steel Co.'s Pittsburg, Calif. plant subsidiary of U. S. Steel Corp., according to O. L. Pringle, vice-president in charge of operations.

During the year ending Dec. 20, Columbia's Pittsburgh shipments had reached 297,758 net tons as against the best record established in 1944 of 293,144 net tons.

This record tonnage was rolled in the face of considerable difficulties which arose because of the $25 million building and expansion program being carried out at the Pittsburg plant. Very often production was handled on a hand-to-mouth basis and all production required keen and well planned scheduling.

Geneva Steel Co. at Geneva, Utah reported total shipments as of Dec. 31 at 517,665 net tons of plates and 104,834 tons of structurals, or a total of 622,499 net tons. In view of the shortages of coal which reduced iron production, and the establishment of a new rated capacity of approximately 784,000 tons of ingots per year, this production is considered excellent. The theoretical rated production of the Geneva mills has been reported as 700,000 net tons of plates and 200,000 net tons of shapes. However, these capacity figures were never approached and last year's record is outstanding especially in view of the fact that this mill has been in peacetime operation approximately only a year and a half.

No figures have been released by Bethlehem-Pacific Coast Steel Corp., but officials there state that in all departments previous production records have been broken.

A similar report was released by Kaiser Co., Inc., Iron & Steel Div. on its operations at Fontana, Calif., where shortages of scrap and modifications in finishing facilities might well have seriously affected total production.

Pacific States Steel Corp. at Niles, Calif., reports that approximately 110,000 tons of finished products were produced. This is just about capacity under the present limited steel making facilities. This company has an expansion program under way which involves the installation of four 60-ton openhearths which will probably not be in operation until late 1948 or possibly early 1949.

BOTH the Northwest steel rolling mills at Seattle and Oregon steel mills at Portland report capacity operations for the year.

Whether the optimism being exhibited by western producers over their ability to come considerably closer to meeting the demands of western steel users during 1948 will prove more justifiable than a similar attitude at this time a year ago, is problematical. The facts indicate that some optimism is warranted because of the approaching completion of such expansions and new facilities as at Columbia's Pittsburg plant and at Kaiser's Fontana plant. However, no steel producer is promising very much beyond some "slight betterment" in supply for 1948 and even there, these improvements will not be apparent until the third quarter.

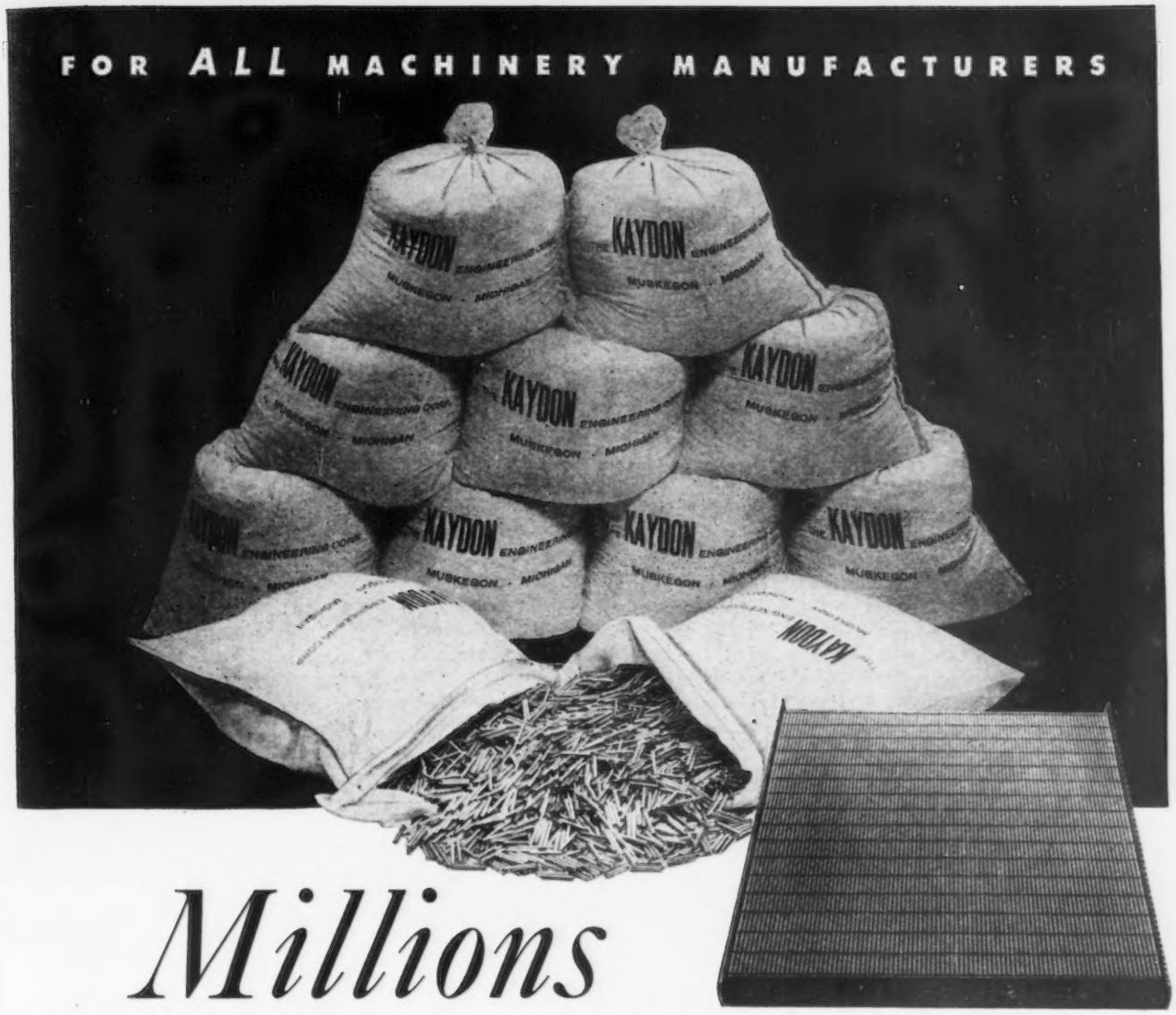
One uncertainty on the production horizon for the new year is the attitude of labor in the steel industry but even here there is a considerable amount of optimism expressed.

Arnold F. Campo, international representative of USWA, CIO, with headquarters in Oakland, Calif., last week told a group of industrial relations men that in his opinion labor relations in his union on the West Coast were as good or better than anywhere else in the country. There are approximately 40,000 members of the United Steel Workers in the eleven western states of whom 25,000 are in California. Mr. Campo is now engaged in attempting to coordinate the negotiations and secure a master contract in the can-making industry which, of course, involves American Can Co. and Continental Can Co. These two steel users have approximately 8000 employees.

There are still approximately 15,000 steel workers in California unorganized, according to Mr. Campo and efforts will continue to incorporate them into the CIO union, but according to this international representative, "raiding" will in no case be resorted to.

SALT LAKE CITY—Action of WAA in setting aside three bids for the Kalunite, Inc., plant here and offering to sell the surplus property to the lowest bidder for the price offered by the highest bidder came as something of a surprise even though informed observers had predicted that WAA was sympathetic to the small independent operator who made the lowest bid. This policy is almost directly opposite to that set in the sale of the Geneva steel plant to the nation's largest steel producer.

J. R. Simplot Co. of Boise, Idaho last month was given 10 days to accept the plant at a price of $752,000 which had been the bid figure of the American Potash & Chemical Corp. The only other bidder was Columbia Metals Corp., which offered $635,000 for the property. All three bidders want the plant for the production of fertilizer and



Millions

of KAYDON *precision needle rollers

*Tolerance on diameter .0002". On the Inspection Board shown above are KAYDON Needle Rollers .1250" diameter.

The success of KAYDON Precision NEEDLE ROLLERS in automobile and truck transmissions, universal joints, clutches, steering gears and other products, has led to their use in practically all types of machinery.

Since these needle rollers may be used between hardened shafts and hardened bores of housings or gears, they eliminate the need for bearing races. Thus they provide the most compact high-capacity anti-friction bearing possible, requiring little or no more space than so-called plain or "solid" bearings.

Millions of these precision needle rollers are being made in standard sizes, 1/16" to 5/16" diameters (tolerance .0002" on diameter), flat or rounded ends. Other sizes are being added as "standard" when quantities warrant.

By using standard sizes that are now in big volume production, you get the benefit of low cost for highest performance-proved quality in small or large quantities . . . but regardless of whether your machine design permits use of standard sizes or demands special needle rollers, contact KAYDON.

Be sure to state sizes and quantities when you send your inquiries.

Capacity also available now for all types and sizes of KAYDON Standard or Special Bearings. It pays to "contact KAYDON of Muskegon."

KAYDON *Types of Standard or Special Bearings:*
Spherical Roller • Taper Roller • Ball Radial
Ball Thrust • Roller Radial • Roller Thrust

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All types of Ball and Roller Bearings 4" bore to 120" outside diameter

all have had experience in this industry.

Columbia Metals Corp. which operates a section of a similar plant in Salem, Oregon is to be given the opportunity to negotiate directly with the WAA for the Oregon unit, it is reported by War Assets Administrator Jess Larson.

J. R. Simplot Co. has a limited time in which to make a down payment of 10 pct of the purchase price and another 10 pct at the time of closing the deal. The balance is to be paid in quarterly installments and will be insured by a 15-year mortgage carrying four pct interest.

American Potash & Chemical Co., labeled "Big Business", was at a disadvantage because of its size and the opposition to awarding the plant to this company was based primarily on that fact. Argument over the disposal of the plant is apparently not ended as American Potash officials have announced that they intend to protest the negotiated sale to the lowest of the three bidders. It is believed that if WAA rejects the protest of American Potash, that company could probably carry its fight to the courts, but so far no indication of this action has been given.

Jack Simplot, head of the company bearing his name, plans considerable expansion in the production of phosphoric acid and ammonia sulphate which will require an additional investment estimated at between $500,000 and $750,000. Mr. Simplot has established a high reputation for aggressiveness and ingenuity based on his wartime record in food dehydrating and fertilizer plants in the Intermountain area.

Mr. Simplot now has a lease on large phosphate deposits on the Ford Fall Indian Reservation 30 miles from Pocatello, Idaho. He recently made arrangements with Westvaco Chlorine Products Co. which permit that company access to these deposits. Westvaco has announced plans for an electric furnace plant for the production of elementary phosphorus at Pocatello. United Engineers & Constructors of Philadelphia will be in charge of plant construction which is to be ready for operation early in 1949.

Originally built at a cost to the government of $4,533,373, the Kalunite plant was designed for the production of alumina and potassium sulphate as a byproduct. Alunite was mined at Marysvale, Utah for reduction at the local plant. Soon after operations were begun it was determined that it was both uneconomical and impractical to recover alumina in quantity by the processes then being used experimentally.

* * *

LEFT - WING radicalism in unionism has been given what some observers believe is an important body blow and may portend a trend extending beyond this immediate Utah-Nevada district.

The fight which has been going on inside the CIO International Union of Mine, Mill & Smelter Workers over what has been termed "communistic" control appears to be shaping up for a definite showdown. Two local unions have formally withdrawn from the International, the latest one being the Pioche, Nev. local with a membership of about 365. The first to withdraw in this area was the local at the American Gilsonite mine in southeast Utah where 90 odd members reportedly voted unanimously for this action.

Representatives of the International union have retaliated by declaring the action of the locals unconstitutional and illegal and have gone so far as to appoint an administrator and notifying the employers that dues collected by the companies must be turned into the International under the terms of the contract. These officials take the position that the contracts have been made with the International and that when a local disaffiliates it ceases to be the bargaining agent.

Disaffiliating locals reportedly will ask for new elections on the theory that this will automatically eliminate the International inasmuch as the officials have not signed the non-communistic pledge provided for under the Taft- Hartley Act. Maurice Travis, International president, recently met with representatives of the local union in Salt Lake City. Grapevine reports from the stormy session were to the effect that Mr. Travis and his supporters were unable to push through a resolution denouncing and opposing the Taft-Hartley Act.

* * *

Officials of the Geneva Steel Co. are waiting with considerable interest a report by the Utah Tax Commission which will inform them as to the amount of sales tax to be levied against the company now that Attorney General Grover A. Giles of Utah has ruled that the company is subject to such a levy.

In announcing his decision, Mr. Giles said, "It cannot be denied that there is considerable question as to any interpretations which may be placed upon our law as it is applied to this transaction. We have no authority at all to guide us." Apparently the decision against the Geneva Steel Co. was based on the fact that negotiations were carried on between the company and WAA and not directly through the Reconstruction Finance Corp. It is expected that this matter will be taken to the courts to decide since considerable amounts of money are involved and the action would probably set a precedent for future assessments.

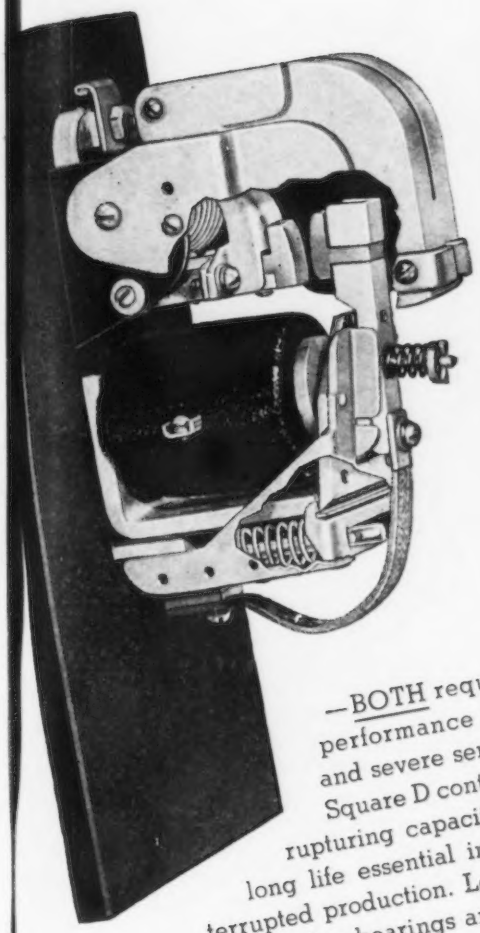
PORTLAND — Recently completed preliminary reports on the bauxite deposits in the islands of the Pacific formerly under Japanese mandate are tending to revive the hope that this area may be selected as the location for an alumina reduction plant.

Even before the war, local interests considered the possibility of importing bauxite and reducing it locally for use in the Northwest aluminum reduction plants. However, the growth of the aluminum reduction industry came simultaneously with the war and importations of raw materials from overseas were, of course, impractical.

The reports of the U. S. Geological Survey indicate that bauxite has been found on a number of islands and that the largest known deposits thus far are on Babelthuap Island in the Palau Group. It is stated that potential reserves on that island alone may amount to as much as 15 million tons and occurs in blanket deposits of from 3 to 10 ft in thickness at, or near, the surface. They are believed to represent the product of the laterization of volcanic rock of which the principal contributor apparently was andesite.

Japanese mining operations on the islands now under investigation were extensive and the ore was washed to remove the nodules and masses of bauxite from the clay. A typical analysis of the washed product is reported as: Al_2O_3, 51.65 pct; Fe_2O_3, 15.84 pct; SiO_2, 1.85 pct; TiO_2, .90 pct; loss on ignition, 29.74 pct.

Square D HEAVY DUTY D.C. Contactors are used on BOTH Mill Auxiliary and Accessory Machine Control Panels Because . . .



—BOTH require consistent performance under difficult and severe service conditions. Square D contactors have high rupturing capacity and unusually long life essential in providing uninterrupted production. Low inertia moving parts, knife edge bearings and strong blowouts contribute to fast operation necessary for both mill auxiliary and accessory machine control. Another important advantage—the problem of stocking spare parts is minimized through use of the same heavy duty construction.

Although identical contactors are used for both mill auxiliary and accessory machine control, the real difference in completed panels is governed by variations in assembly and construction features listed in the table below.

***Write* for information on Classes 7735, 7736, and 7950 Heavy Duty D. C. Control. Square D Company, 4041 N. Richards Street, Milwaukee 12, Wisconsin.**

FEATURES	MILL AUXILIARY CONTROLLERS	ACCESSORY MACHINE CONTROLLERS
Heavy duty contactors	X	X
Negative line contactor	X	
Accelerating contactors	X	X
—with blowout		Available
—without blowout	X	X
Heavy duty control relays	X	X
Heavy duty shunt field relays	X	
Pneumatic timers for acceleration	X	X
Overload relay		
2 THERMAL-MAGNETIC		
1 melting alloy thermal trip	X	X
Terminals		
—mounted rear of panel	X	
—mounted front of panel	X	Available
Main line knife switch	X	X
Control knife switch	X	Available
Control circuit fuses	X	
Heavy gauge sheet steel enclosures	X	
Vault type door mechanism	X	
Enclosure removable back plate		

Class 7951 Reversing, Dynamic Braking Control for Mill Auxiliaries.

Class 7736 Reversing Dynamic Braking Control fo Accessory Machines.

SQUARE D COMPANY

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PERSONALS

SHERLOCK DAVIS, president, Charles Fischer Spring Co.

• **Sherlock Davis**, formerly Colonel, General Staff Corps, U. S. Army, has been named president of the Charles Fischer Spring Co., Brooklyn. A new board of directors has been elected, consisting of Col. Davis, **Fred Hunter**, president of American Time Co.; **Judge Sol Rubin, Louis Septimus** and **Julius Yablok.**

• **George C. Floyd** has been elected vice-president in charge of operations, Thomas Steel Co., Warren, Ohio.

• **Frank J. Grumbach** has been appointed district representative of Berger Mfg. Div., Republic Steel Corp., in Charlotte, N. C. Mr. Grumbach will handle Berger sales in North and South Carolina, western Tennessee, southern Virginia, Augusta and Savannah, Ga.

• **Ross G. Allen** has been appointed comptroller of the Southern States Iron Roofing Co., Savannah, Ga. Mr. Allen, who joined Southern States in 1946, had been manager of the forecasting and budget control division of the company. **Lionel E. Drew** has been appointed to the position of acting assistant secretary and treasurer. Mr. Drew, who joined Southern States in December, assumes the duties of W. L. Farrior, assistant secretary and assistant treasurer, who has taken an indefinite leave of absence. **Elmer S. Johnson** has been appointed credit manager of the company. Most of his previous business experience has been with Montgomery Ward & Co.

o o o

• **John M. Ellis**, assistant to vice-president, Bethlehem Steel Co., Bethlehem, has retired following 44 years as a Bethlehem sales executive.

• **John F. Smith, Jr.** has been appointed general manager of sales of Inland Steel Co., Chicago. He succeeds **Albert C. Roeth** who has retired. Mr. Smith joined the Inland organization in 1929 and in 1946 was appointed assistant manager of sales of the sheet and strip division. **John J. Davis, Jr.** has been appointed manager of sales, railroad division; **William D. Truesdale, Jr.**, manager, claim division; and **William E. Geidt**, manager, advertising division. Mr. Davis joined the railroad division of Inland in June 1947, after having been with Carnegie-Illinois Steel Corp., as manager of sales, railroad material sales. Mr. Truesdale has been assistant manager, claim division, and Mr. Geidt has been assistant to the advertising manager. Mr. Davis and Mr. Truesdale, respectively, succeed **William J. Hammond** and **Ernest M. Bannister**, who have retired. Mr. Geidt replaces **Keith J. Evans**, who will devote his entire time to his duties as advertising manager of Joseph T. Ryerson & Son, Inc., a subsidiary of Inland Steel.

JOHN F. SMITH, JR., general manager of sales, Inland Steel Co.

LEWIS HAMLIN, executive vice-president, Redmond Co., Inc.

• **Lewis Hamlin**, vice-president in charge of plant operations at Redmond Co., Inc., Owosso, Mich., has been named executive vice-president. Mr. Hamlin joined the Redmond organization in 1936, having left the experimental department at Marvel Carburetor Co. His work at Redmond has taken him from salvage supervision to chief inspector, then plant superintendent and production manager, after which he was appointed vice-president.

• **Charles W. Meyers** has been named director of spring sales in the manufacturers products sales division, American Steel & Wire Co., Cleveland. He started work in the company's Cuyahoga works as a chemist in 1923. During the war he served as special representative on aviation products and in 1946 was named assistant manager of the wire rope and construction materials division. **Edwin T. Eggers** has been named to succeed Mr. Meyers as assistant manager of the wire rope and construction materials division. He started with American Steel & Wire Co. in 1934. He served as a salesman in the company's Philadelphia office for a year, and then in the Chicago district sales office from 1935 to 1943. Since 1943 he has been the company's special representative in the midcontinent oil fields.

• **Ray W. Rowney**, formerly assistant treasurer of the Sawhill Mfg. Co., Sharon, Pa., has been promoted and elected to the office of treasurer.

CMP

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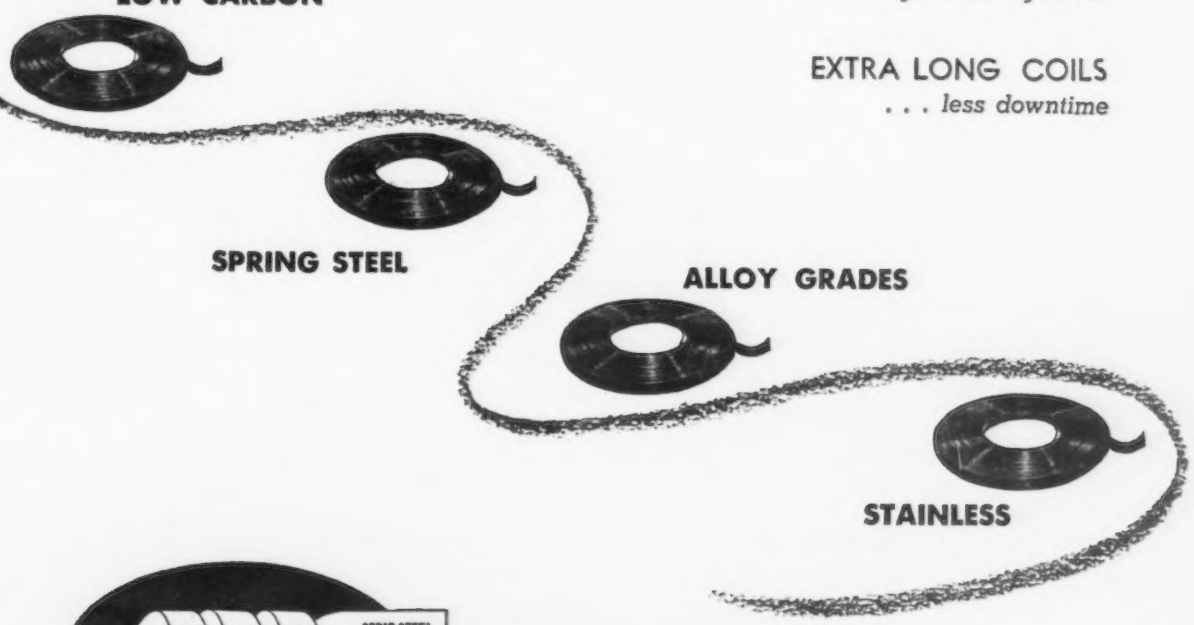
with *Production Boosting* ADVANTAGES

WIDE RANGE OF PHYSICALS AND ANALYSES
. . . tailored for your products

EXTREMELY CLOSE TOLERANCES
. . . more parts per ton

GAUGES THIN AS .001
. . . strength with lightness

EXTRA LONG COILS
. . . less downtime



C M P PRECISION COLD ROLLED STRIP STEEL

The Cold Metal Products co.
YOUNGSTOWN 1, OHIO

NEW YORK • CHICAGO • DETROIT • ST. LOUIS • BUFFALO • INDIANAPOLIS • LOS ANGELES • SAN FRANCISCO

R. CONRAD COOPER (left), vice-president—industrial engineering, M. W. REED (center), chief engineer, and RICHARD F. SENTNER (right), assistant vice-president—sales, U. S. Steel Corp. of Delaware.

• **R. Conrad Cooper** has been named vice-president — industrial engineering, U. S. Steel Corp. of Delaware, Pittsburgh. He has been assistant vice-president — industrial relations since 1945. After holding various positions in the field of industrial engineering, Mr. Cooper joined the Wheeling Steel Corp. in 1937 on the staff of the vice-president in charge of operations, and served as assistant vice-president from 1940 to 1945. **M. W. Reed** has become chief engineer of U. S. Steel Corp. of Delaware. Mr. Reed, who has served with subsidiaries of the U. S. Steel Corp. continuously since 1916, had been vice-president—engineering, Carnegie-Illinois Steel Corp. since April of 1947. He was first employed in 1916 at the North Works of American Steel & Wire Co. **Richard F. Sentner** has been made assistant vice-president—sales of U. S. Steel Corp. of Delaware. He began his business career with the Wheeling Steel Corp. in 1926. He was appointed assistant manager of tinplate sales in 1933 and in 1941 became manager of tinplate sales for the company. In 1942 Mr. Sentner joined the WPB, which he left in 1945, returning to the Wheeling Steel Corp. as assistant manager of sales.

• **Samuel H. Collom, Jr.** has been elected executive vice-president in charge of production of the Pennsylvania Flexible Metallic Tubing Co., Philadelphia. He was formerly vice-president and treasurer.

• **J. Gill Stanley** has been named manager of the Buffalo branch and district sales office of Columbia Steel & Shafting Co., Edgar T. Ward's Sons Co. Div. and Summerill Tubing Co. Div. He entered the steel business in 1934, and was employed by these companies in 1940. For most of the last 2 years Mr. Stanley has been in charge of the Rochester sales office.

• **R. H. Webber** has been appointed works controller at the Crucible Steel Co. of America Halcomb works, Syracuse, N. Y. Mr. Webber was formerly with Radio Corp. of America at Indianapolis and prior to that time had been associated with Carnegie-Illinois Steel Corp.

• **James E. Goodman** has been appointed general manager of the Buick-Oldsmobile-Pontiac Assembly Div. of General Motors Corp., Detroit. Mr. Goodman, who has been serving as assistant general manager, succeeds **W. S. Roberts,** who because of illness has been granted a disability leave of absence.

• **Robert Conray** has been appointed staff assistant to George E. Whitlock, president, and Harry M. Heckathorn, executive vice-president, Mullins Mfg. Corp., Salem, Ohio. Mr. Conray was formerly associated with Wheeling Steel Corp., where he established an extensive apprentice training program.

• **George R. Vassily** has been appointed representative in charge of the sales of E. W. Bliss Co.'s mechanical and hydraulic presses and can machinery in the Pittsburgh area. Prior to this appointment, Mr. Vassily was a Bliss sales engineer at the Brooklyn office.

• **Norman C. Einwechter,** assistant to the vice-president of Carpenter Steel Co., will be in charge of the Philadelphia-Reading sales territory, with headquarters in Philadelphia. Mr. Einwechter has been associated with Carpenter since 1929.

• **A. E. Petermann,** general counsel, **H. Y. Bassett,** general manager of the Wolverine Tube Div., and **A. H. Wohlrab,** general manager of the Calumet Div., have been elected vice-presidents of Calumet & Hecla Consolidated Copper Co., Detroit. **Robert Livermore** has retired as vice-president, but will remain as a director.

• **Earl W. Dilg** has been appointed district manager of the Patterson Foundry & Machine Co. of East Liverpool, Ohio, with headquarters at the Cincinnati office of the company. Mr. Dilg was formerly chief engineer and sales manager of International Engineering, Inc., of Dayton.

• **A. B. Bechaud,** sales manager of the Ben Hur Mfg. Co., Milwaukee, has been elected vice-president of the firm.

• **Kenneth F. Ames,** general sales department member, and **Russell S. Cornell** and **Truman E. Sage,** district sales representatives of Caterpillar Tractor Co., have been named assistant sales managers of the central, eastern and western sales divisions, respectively. Messrs. Ames and Cornell will make their headquarters at the Peoria, Ill., plant and Mr. Sage will serve at the San Leandro, Calif., plant. Mr. Ames joined Caterpillar in 1936 as a member of the sales training division and served in the central sales division and as agricultural representative until 1941. Mr. Cornell became associated with Caterpillar in 1935 as a member of the inspection division. He transferred to the engine sales division in 1936 and to the eastern sales division a year later. Mr. Sage came to Caterpillar in 1937 and served for 8 years in the accounting and purchasing department. He joined the sales training division and was named a western division district representative in 1946.

• **W. F. Newbery,** formerly industrial sales manager, has been appointed assistant director of sales of Detrex Corp., Detroit. Directly reporting to Mr. Newbery are **LeRoy Camel,** the new sales manager of the industrial products division; **H. S. Tweedy,** industrial service manager; **H. J. Lucey,** oil-extraction and export sales manager, and **G. W. Walter,** advertising and sales promotion manager.

• **John T. Brown,** former vice-president in charge of factory operations for the Chain Belt Co., Milwaukee, has been named vice-president in charge of factory operations for the J. I. Case Co., Racine, Wis.

• **A. J. Raitch,** former chief engineer for the Bolens Products Co., Port Washington, Wis., has been appointed chief engineer of the Centaur Div. of the Le Roi Co., Milwaukee.

• **Ben H. Sachs, Jr.,** has joined Helburn Engineering, Cincinnati representative for American Air Filter Co., Inc., Louisville. He has been with AAF since 1946 and will represent the air filter, dust control, and engine and compressor divisions.

T. H. WICKENDEN, vice-president, International Nickel Co., Inc.

• **Ralph D. Parker, J. Roy Gordon** and **Herbert G. Fales** have been elected assistant vice-presidents of the International Nickel Co. of Canada, Ltd. Also **Walter C. Kerrigan, James F. McNamara** and **T. H. Wickenden** have been elected vice-presidents of the company's United States subsidiary, the International Nickel Co., Inc., New York. Joining International Nickel in 1930, Mr. Kerrigan had been an assistant manager of its nickel sales department from 1933 to 1946, when he was appointed manager, a position he continues to hold. Mr. McNamara became associated with International Nickel in 1911, in the position of salesman and, after serving in various capacities in the company's Bayonne plant, was appointed sales manager for the company's mill products in 1921. He continues in this position. Mr. McNamara is a director of Lukens Steel Co. Mr. Wickenden joined International Nickel in 1922, when he was placed in charge of developments in the automobile field for the development and research division at New York. He was appointed assistant manager of the division in 1931. In 1943 he was made manager of the development and research division, which he continues to head. Mr. Parker, one of the newly-elected assistant vice-presidents of the parent Canadian company continues as general superintendent of that company's mining and smelting division at Copper Cliff, Ont., a position he has held since 1930. Mr. Gordon joined International Nickel in 1936 as director of research at Copper Cliff, becoming technical assistant to the vice-president in 1946. Mr. Fales continues also as a vice-president and director of the International Nickel Co., Inc.

• **Harry F. Brown** has been promoted to general manager of the explosives department and **Samuel G. Baker** to general manager of the electrochemicals department, E. I. du Pont de Nemours & Co., Wilmington. Both men have been assistant general managers of the departments they will head. Mr. Brown succeeds **William H. Ward,** who has been elected a vice-president of the company, and Mr. Baker succeeds **F. S. MacGregor,** who has retired.

• **Michael L. Lavorgna,** district sales manager for the L. J. Mueller Furnace Co., Milwaukee, for the last 10 years, has resigned to become sales manager of the Richmond Radiator Co., an affiliate of Reynolds Metals Co., and will make his headquarters in New York.

• **Charles B. Proudfoot,** formerly assistant director of the engineering and physics division of Fredric Flader, Inc., has been engaged by the Carborundum Co. as senior research engineer in physics of the Carborundum Research & Development Laboratory, Niagara Falls, N. Y.

OBITUARY...

• **J. P. McCaslin,** 68, for many years general superintendent, Corrigan, McKinney Steel Co., and a production executive in plants of Carnegie-Illinois Steel Corp., Pittsburgh, died Dec. 20.

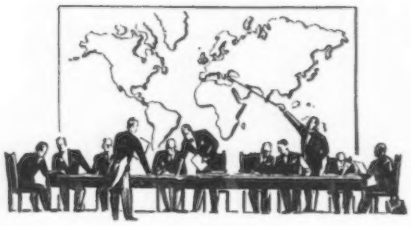
• **William M. Andrews,** 62, died Dec. 28. He was president of Union Limestone Co., New Castle, Pa.

• **Hans B. Kraut,** 66, chairman of the board, Giddings & Lewis Machine Tool Co., Fond du lac, Wis., died Dec. 26.

• **Harry L. Frevert,** director of the Midvale Co., Nicetown, Pa., and president from 1931 to 1944, died on Dec. 11 after a short illness.

European Letter . . .

• Effectiveness of Russia's latest reforms depends on ability to stabilize new level of prices . . . Government hopes to intensify incentives to higher production by improving living standard of working class.



LONDON—It has been argued that the latest Russian currency reform has, on balance, enhanced the purchasing power of the townspeople as against that of the peasants. The old ruble has been exchanged for the new one at the rate of ten to one. Wages and salaries have remained stationary. However, currency and wages must be analyzed in the light of the new structure of prices, which forms part of the reform.

The price structure presents a complicated and confusing picture. It should be noted, first, that the abolition of rationing in Russia does not really mean any abolition of price controls. Over a wide field of Soviet trade these remain in force. The government controls the entire wholesale trade and most of the retail trade, too; and it fixes the prices.

Part of the retail trade in foodstuffs and other consumers' goods is carried on by collective farms, individual members of the collective farms and by members of cooperatives. In that sector of the trade prices have at no time been subject to any control. It is impossible to say what proportion of the retail trade is carried out in the private sector, except that during the war that proportion was high and that now it has shrunk considerably.

Until recently two levels of prices existed in government-controlled trade: Very low prices for goods bought on the ration and very high commercial prices for all sorts of goods, the unrationed ones as well as the rationed ones, if they were bought "off the ration."

Official policy since the end of the war aimed at closing the wide gap between the two categories of prices. The commercial prices were steadily forced down. In September 1946 the ration prices were raised by 200 to 300 pct. At present the commercial prices have been abolished altogether. All state-owned shops are now to sell their goods at single prices which have been fixed roughly at the level of the latest (the increased) ration prices. There will be a difference in the prices of some industrial goods that will be sold to rural consumers, about 10 pct dearer than to townspeople.

Prices of foodstuffs will also vary slightly between the three zones into which the whole country has been divided: The former occupied areas (Zone One), Moscow and Leningrad (Zone Two) and the northern and Far Eastern coastal regions (Zone Three). The prices in the formerly occupied areas are the lowest; those in the coastal areas are the highest. The difference between the extremes is 10 to 15 pct. Since all prices have been brought down roughly to the low ration-level, the reform seems to be extremely favorable to consumers, especially to workers and employees with low incomes.

THIS, however, is only partly true. If the new prices were to be compared solely with the prices that existed immediately before the abolition of rationing, then the conclusion would have to be drawn that the standard of living of the Soviet people has infinitely improved. The essentials remain almost as cheap as, or are even slightly cheaper than they were while rationing was in force; and other consumer goods which could be bought only at commercial prices have now become obtainable for roughly one-third of those prices.

The picture, however, appears less rosy if it is seen in the light of the very low ration-prices which were in force before the increase of September 1946. A glance at the following table will perhaps make this involved comparison somewhat clearer. The first column in the table gives the present uniform prices in government shops in Moscow and Leningrad ("Zone II") which differ only slightly from the last ration-prices. The second column shows earlier ration-prices before September 1946, while the last column illustrates approximately the commercial and free prices in the second half of 1946.

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The new prices compare very favorably with those shown in the third column and very unfavorably with those shown in the second. The present reform is, nevertheless, likely to be popular. The consumer has already forgotten the very low prices for rationed goods which he paid more than 1 or 2 years ago. He took the blow of higher prices last year and is now grateful for the relief that the reform has given him. It should be added that last year's blow was greatly softened through the stepping up of all wages below 900 rubles (per month) by 10 to 35 pct, an increase which did not, however, catch up with the rise in prices. On the other hand, when the prices for rationed goods were at their lowest, often the rations were not honored; and, consequently, the comparison between the present and the lowest ration prices is somewhat unreal.

On balance, the position of workers and employees has considerably improved, though their standard of living is still low. The prices given in the table above should be compared with the average wages and salaries of 500 to 900 rubles per month. If allowance is made for the value of the lodgings and the social ser-

vices with which the Russian worker is provided free, or for a very low payment, then the average weekly earnings of the Soviet worker should now represent the purchasing power of $12 to $16 in England. This comparison is only a rough estimate, and does not reflect the differences between the amenities available in the two countries.

It is evident that some foodstuffs, like meat and butter, and some industrial goods are less accessible to the mass of Russian unskilled workers, even after the abolition of rationing, than they are to workers of the same category in England. But the skilled worker and the Stakhanovite who earns up to 3000 to 5000 rubles a month may now, after the abolition of rationing, feed and perhaps even clothe better than his British counterpart.

THE general improvement in the living standard of the working class, as a whole, is thus accompanied by a widening of the discrepancy between the living standards of various groups of workers. Those with low wages will probably be able to live slightly better than hitherto, while the earners of higher wages will be able to live much better. This is part of the government's deliberate policy to intensify the incentives to higher production.

The whole reform explains itself in the light of the campaign, recently initiated, for the fulfilment of the 5-Year Plan in 4 instead of in 5 years. As the first 2 years of the Plan have already passed, the program of production for 3 years would have to be carried out in the next 2 years. The speeding-up of the tempo is in part explained by the fact that some initial targets of the 5-Year Plan had been set too low.

However, the speeding-up of the 5-Year Plan would hardly have been possible without some sort of a new deal for the working classes. Anybody who has come in contact with Russian workers after the war could easily feel that they resented the peasants' wartime prosperity. This created a certain antagonism between town and countryside, which, although it was politically inarticulate, could not have been ignored by the government.

Prices In Russia

Goods	New Prices in Zone II (roughly equal to the last ration-prices) rubles	Ration-prices up to Sept. 1946 rubles	Commercial Prices, 1946 (approximately) rubles
Rye bread, per kg.....	3.00	1.00	20
White bread, per kg.....	7.00	2.80	100
Beef, per kg.....	30.00	8.00—14.00	70.00—100
Sugar, per kg.....	15.00	5.00—5.60	60.00
Butter, per kg.....	64.00	23.00—26.00	200.00—220.00
Milk, 1 liter.....	3.00—4.00	...	20.00
Eggs, per ten.....	12.00—16.00	6.50	50.00—70.00
Vodka, ½ liter.....	60.00	60.00	60.00
Cigarettes	6.30	3.00—6.00	20.00—25.00
Man's suit, nonworsted....	430.00	300.00—600.00	1200.00—1500.00
Leather shoes.....	260.00	200.00	600.00

THE effectiveness of the latest reforms depends on the administration's ability to stabilize the new level of prices. This in its turn depends on the supply of consumers' goods to government and cooperative shops and on the degree of efficiency of the government-controlled trade. The good harvest should have secured a steady supply of foodstuffs, provided that transport and distribution work properly. The prospects for industrial consumers' goods are less certain, though in recent months much more emphasis has been placed on the output of consumers' goods than at the beginning of the 5-year period.

On the other hand, much has been done in the course of the past year to make the supply of goods to consumers less dependent on the bazaars than it had been before. One hundred thousand new state-owned and cooperative shops—many of them run by associations of war invalids—have been opened in the course of the last year. Bazaar trade by peasants is still permitted; and price restrictions do not apply there. It is only in the context of the currency and price reforms that the meaning of last year's persistent campaign for the revival and extension of cooperative trade has become quite clear. Only through the network of the newly-opened shops can the government hope to keep prices down. Yet, the bazaar-trader remains in action, a virtual competitor with the government-controlled trade; and the level of prices in the provinces will, up to a point, depend on whether the government - controlled shops or the bazaars are better supplied with goods, especially foodstuffs.

MUCH of the further outlook depends also on the peasantry's reaction to the reform. The government has delayed the revaluation of the ruble until the end of the whole agricultural campaign, until its last phase, the delivery by the peasants of agricultural produce to the government, is completed. If the reform had been carried out in the middle of that campaign, it might have caused trouble. The measures by which the government has sought to enhance incentives to higher output in the towns may have weakened such incentives in the countryside. The difference between the new prices in the town and in the countryside may also act as an irritant. The government has apparently been aware of the dilemma; and it has given the peasants an emphatic assurance that their incomes from next year's harvest will not be reduced by any new conversions or other financial measures.

What has, in a sense, been impressive in all the reforms now carried out is the government's ability to maneuver between the two basic classes of Russian society: The workers and the peasants. Repeatedly the government has had to swing now to the one side and now to the other. The pro-*muzhik* policy has, as a rule, been of a rightist shade. Policies favoring the industrial workers have had a leftish coloring. At present, social policy has steered leftwards.

Industrial News Summary...

- **Steel Industry over the Barrel**
- **May Be Forced into Allocations**
- **Scrap May Be on the Move Again**

NO matter what happens to the government sponsored voluntary steel allocation program the steel industry is definitely over the barrel at the present time. If steel firms agree to voluntarily allocate 10 to 15 pct more steel to the farm implement industry, the petroleum industry and to freight cars, thousands of other steel customers are going to get less steel.

If, because of the certainty that any allocation program, voluntary or otherwise, would knock into a cocked hat the present steel distribution picture, the industry should decide to bitterly oppose a voluntary program directed by the government, it will be castigated and held up as recalcitrant at some later date. Then if the steel picture continues tight, as it is bound to do no matter what happens, steel firms might eventually find themselves faced with strict controls backed by governmental authority. No matter what it does, steel is on the spot.

The plan which the Commerce Dept. is to discuss with the steel industry Thursday of this week is as mild as possible under existing circumstances. This characteristic does not eliminate the fact that if certain groups are given more steel it must come out of quotas already set up by steel firms for other steel users. A checked survey by IRON AGE editors indicates almost without exception steel customers are opposed to allocation of steel supplies under government control or suggestion.

Commerce officials admit that the program may mushroom into a greater administrative monstrosity than OPM, SPAB, PRP and other initial wartime expedients. They know also that if industry agreement cannot be reached voluntarily the program isn't worth a hoot. Few if any in government seem willing to admit what most steel customers firmly believe—that the present voluntary quota system in the steel industry is a far better practical solution of steel distribution than anything which could be concocted in Washington.

NEVERTHELESS, faced with the finger of scorn if it doesn't submit to voluntary allocation and taking a chance that more restrictive control would be in the offing, it looks this week as if the industry will be forced into a shotgun wedding with unprecedented peacetime controls—mild or otherwise.

Some consumers and steel producers fear that steel allocations, if put into effect, will provide a major shot in the arm for gray market activity which has lessened some recently because of the glare of publicity and militant action by some steel companies. Small users and even large consumers whose quotas might be cut further early this year must have steel to maintain competitive manufacturing schedules. As they have done in the past, they will obtain it no matter what the price. It is a physical impossibility for steel firms to make and ship steel and at the same time attempt to police or scrutinize what finally happens to steel shipments made to thousands of regular steel customers.

A second large steel producer—Carnegie-Illinois Steel Corp.—has followed close on the heels of Republic Steel in letters to most of its customers telling them that every effort would be made to see that steel shipped against quotas is routed into proper channels. This action follows quiet activity extending over several months in an attempt to keep material from getting into the gray market.

Steel consumers are in for another jolt soon because of the second freight rate advance. The rate raise will force additional steel firms to withdraw from distant territories because present steelmaking costs will not allow them to absorb the additional freight necessary to remain competitive in those areas. This means that some steel users, like others in the past several months, will find themselves without prime sources of supply. And it won't be long until they are standing on the doorstep of companies close by who have all they can do to take care of their customers who are already on the books.

Steel companies shipping into the Detroit area continue to take it on the nose when it comes to freight absorption. The latest freight advance will add substantially to the cost of steel to the producer when shipped into Detroit because of the arbitrary basing point there which this week showed no signs of being advanced. Many steelmakers are now absorbing $5.40 on every ton of steel delivered in the Detroit area.

STEEL mills have been struggling for 2½ months to make a buyers' strike against scrap interests stick. Now the mills are desperate for scrap to maintain steelmaking schedules and are reentering the market. There are no confirmed sales to large mills as yet, but signs in large scrap generating areas indicate new interest for shipment to the large consuming areas. In the absence of price changes on No. 1 heavy melting steel scrap at Pittsburgh, Chicago or Philadelphia, THE IRON AGE scrap composite price remains at $40 per gross ton, the same as last week.

Steel operations this week are up 1 point to 98 pct of rated capacity. Some firms would operate slightly higher if more scrap were available at present prices. This latter condition may be cleared up within a week or two. Scrap consumers unwilling to buy this week may be in the market next week paying higher prices.

Increased freight costs, the almost certainty that steel labor will receive a moderate wage increase, the probability of higher ore prices and the chance that miners' wages and the price of coal may be advanced this year, all point to a strong possibility that steel prices must be advanced before the next several months go by.

• **LARGEST CONTRACT**—Lustron Corp. has placed the largest contract ever awarded for enameling furnaces. The furnaces will be installed at the old Curtiss-Wright plant which has been taken over by Lustron. The five enameling furnaces, which will be capable of handling 500,000 lb an hr, will cost $1 million. The furnaces are electrically heated and, according to Lustron, the power requirements for this plant alone would light all the homes in Columbus.

• **CAST ALUMINUM**—Aluminum cast and wrought products took a sharp jump in 1947 production-wise, collectively totaling about 14.8 pct over 1946 output. Wrought products in 1946 totaled 1,140,849 lb and for the first 9 months of 1947 totaled 988,171 lb, or about 1,317,000 lb for the year. Cast products totaled 388,711 lb in 1946 and 329,300 lb during the first 9 months of 1947, or about 439,000 lb for the year. October 1947 was the top production month since the war on both wrought and cast products.

• **KAISER PIPE MILL**—Early this week the Fretz-Moon continuous butt weld pipe mill began operations at the Kaiser Co., Inc. steel plant to produce sorely needed pipe in diameters of ½ in. to 4 in., both black and galvanized. First run was on 1½ in. pipe. The mill, which has rated capacity of 145,000 net tons per year, was authorized in the latter part of 1945 as part of an $11 million expansion program at the Kaiser mill. This is the first mill of its kind west of the Mississippi.

• **COMMERCE PREDICTS**—The Dept. of Commerce recently predicted that production of passenger cars will stay around 5 million units per year for several years because of heavy factory backlogs. On the other hand the department said the demand for heavy trucks has about been met and the suppliers of medium trucks are expected to be able to meet demands for their products in the near future. The department pointed out that a heavy unfilled demand for lightweight trucks continues.

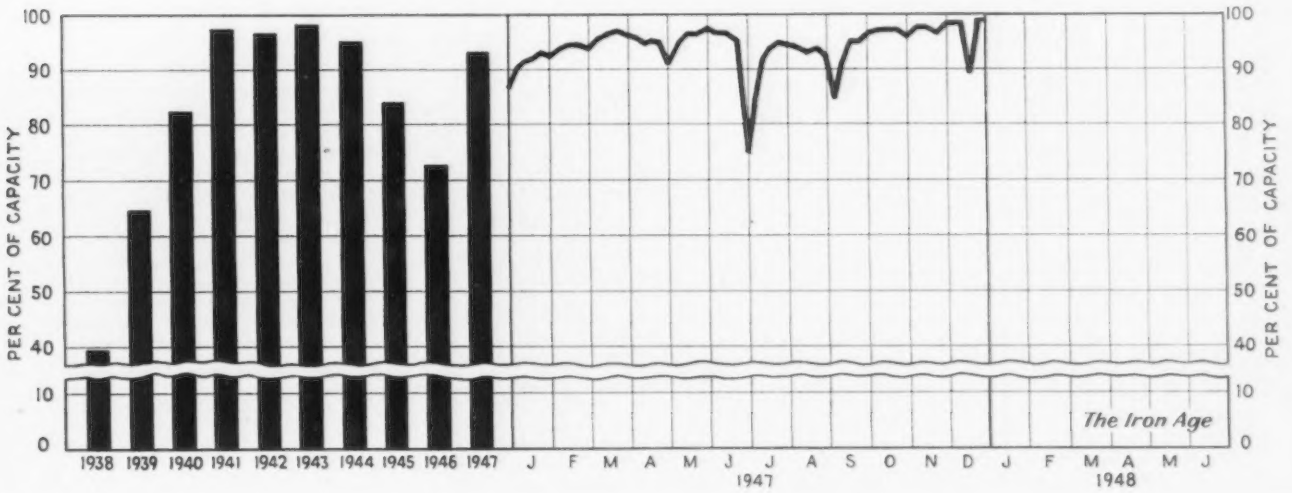
• **EXPORT STEEL**—For the first time since the war the government will exercise more realistic control over iron and steel product exports. The Office of International Trade of the Dept. of Commerce requires, effective Jan. 1, that an exporter show proof that he actually has the steel to export. This will put an end to a lucrative practice of some independent export houses; no longer can they get licenses for astronomical quantities of steel and peddle them to exporters who actually have the steel to ship.

• **FREIGHT CARS**—Despite Washington talk about a 15,000 car a month program, steel producers still have no concrete information on it. First quarter steel allocations are for enough to build 10,000 new cars and repair several thousand old ones. Repair steel can't be accurately measured because some goes into cars, some into repair shop facilities. Industry sources predict that if the new car program is boosted 50 pct, attainment of that figure will be delayed about as much as the 10,000 car quota. An additional hurdle for the higher program will be the labor supply.

• **EMPLOYMENT**—Employment in the steel industry, including blast furnaces, rolling mills and fabricating plants, continued its increase as an overall gain of 150,000 during November brought non-agricultural employment to a high of 43,450,000. November workers in major durable goods manufacturing industries were: iron and steel, 1,884,000; machinery, including electrical, 2,296,000; automotive, 982,000; other transportation equipment, 561,000; nonferrous metals, 466,000; mining, 896,000; construction, 1,852,000.

• **BRITISH SHORTAGE**—In spite of the shortage of castings in Britain, foundries there are working at only two thirds capacity. Shortages of pig iron and scrap are blamed. It is doubtful whether foundry iron blast furnace capacity will prove sufficient to meet the requisite of 2.5 million long tons for 1948, especially since competition by steelmaking will be keen.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
December 30	104.0	93.0*	93.0*	93.5	97.0*	102.0	94.0*	100.0	101.0	117.0	100.0	89.5	108.0	97.0
January 6	104.5	93.5	93.0	93.5	93.0	102.0	99.0	102.0	97.0	113.0	96.0	89.5	94.0	98.0

* Revised.

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... sets new production records, makes better cleaners at lower cost

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At one time, Electrolux inspectors rejected as much as 35% of the tubes needed for the Electrolux cleaner hose assembly because they did not measure up to the maker's inspection standards. This constant rejection cut production of the more than one million Electrolux cleaners needed yearly to meet tremendous demands.

When a J&L Engineer went to work on the problem he learned the reasons for these rejections. Lengths of tubing which serve as *wands* or handles, nozzles and hose fittings had to be expanded at one end, swaged at the other, bent, rolled and slotted to fit together perfectly. Then, all pieces must first be copper plated, nickel plated and finally chrome plated to give a lustrous, long-lasting finish.

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A test run in the Electrolux plant *proved* J&L Electricweld tubing superior on every count! It fabricated without weld failures and took plating excellently. Rejection of tube parts dropped to almost nothing. Production was *stepped up*, costs *reduced*, thousands of feet of tubing saved each month. Electrolux quality was maintained with a saving in time, money and materials—all important to the Electrolux policy of maintaining its prewar price and service to its several million customers.

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JONES & LAUGHLIN STEEL CORPORATION

Steel Industry Views Commerce's Plans for Voluntary Allocation

Washington

• • • **The steel industry** was presented this week with the Dept. of Commerce's plans for administering the voluntary allocation law and in turn was asked for its views on the subject. The meeting called by Secretary Harriman for Jan. 8 is another in a series which began on Nov. 25.

Briefly, Commerce would like the steel industry to agree to increase the amount of steel going into freight cars, farm equipment, and petroleum production and distributing equipment by 10 to 15 pct.

Other topics on the agenda were government aid in increasing supplies of scrap, current distribution practices, and pig iron. In regard to pig iron, Commerce is particularly interested in the distribution of merchant iron largely because of the volume of complaints being received from foundries claiming to have been cut off from their normal sources of supply.

The meeting was preliminary in that it will probably be some weeks before any firm voluntary programs are worked out for distribution of steel to critical areas of the economy.

As presently planned, the administration of the voluntary allocations program will be handled by the department's Office of Domestic Commerce, headed by H. B. McCoy. Industry personnel will play a large part in the program, provided Commerce can obtain their services. It is planned to organize a small group of part-time industry negotiators headed by a prominent industrialist to be attached directly to Secretary Harriman's office. This group will be used to sell the program to American business.

Along with industry advisory committees, Commerce, hoping to establish a small WPB-type organization, would also like to take on about a dozen industry men for the initial programs; additional personnel will be hired if the program expands. Rounding out the professional staff will be government statisticians, economists and lawyers to analyze bills of material and pass on the legality of agreements reached.

Freight Cars, Farm Equipment Receive High Priority On Government List

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By EUGENE J. HARDY
Washington Editor

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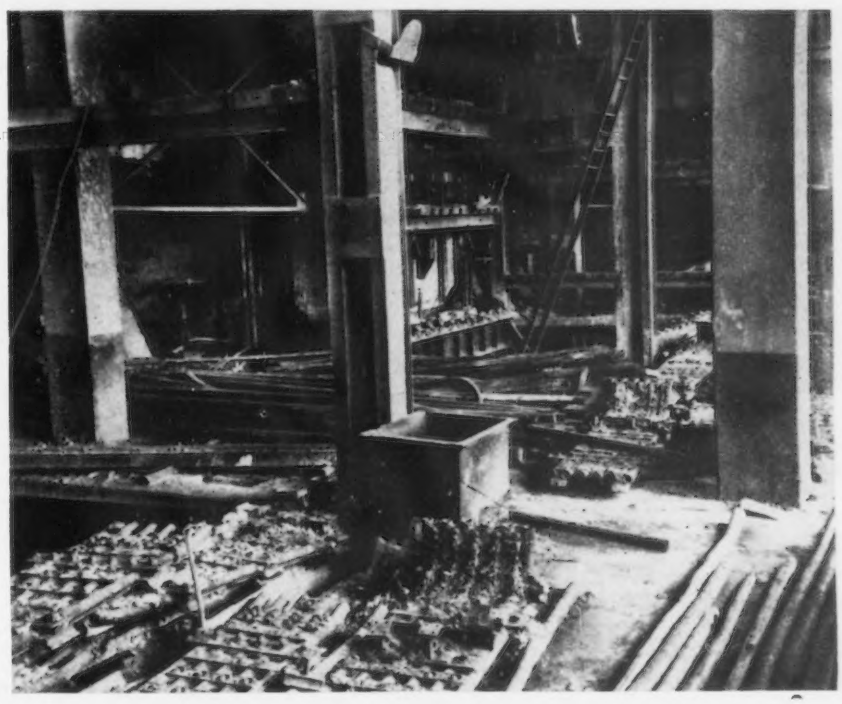
Commerce feels that its primary task in administering the voluntary allocation program is to step up production of commodities that are vital to the European Recovery Program and also important to the domestic cost-of-living index. Consequently, the Department will concentrate on steel, pig iron, freight cars, farm equipment, petroleum equipment, nitrogen and soda ash in the initial planning stages. Other commodities under study for possible vountary action include aluminum, nonferrous metals, lumber, electrical generating equipment, textiles, and hides and leather.

Taking increased production as a base for its program, Commerce has indicated willingness to use the voluntary mechanism to aid in expediting expansion programs within the steel industry if such help is requested. If such a plan were agreed to, an effort would be made to establish a voluntary preference program for steel production among producers of steelmaking equipment, oxygen equipment, coal-treating machinery, etc. However, it is realized that the government has no power to cancel contracts or disrupt order boards and that agreement between the producing and recipient industries is necessary if any degree of success is to be achieved.

In any case, many important problems still remain to be ironed out before any allocation program becomes effective. For example, will the agreements provide for the purchasing agents of the recipient industry to sit down with the sales representatives of the steel industry, or will the steel industry, allocate the material required, leaving distribution entirely in the hands of the recipient industry, or will the government

STRIPPED PLANT: *Generators from this Chinese power plant in Fushun, 30 miles from Mukden, Manchuria, have been removed and shipped to Russia. Only the foundations for the machines remain, another grim scene in a troubled nation.*



attempt to oversee the distribution? Current thinking within Commerce indicates that a combination of all the above possibilities will be utilized, with less emphasis on direct contact between purchasing agents and sales representatives.

Another problem that will require some study concerns producers of steel who have no historical record of dealing with manufacturers of products for which Commerce would like to set up voluntary programs.

Finally, how will orders be handled on mill schedules, once the steel industry committee has agreed to a bill of materials for a specific industry? At the present time, an informal system of priorities calling for the marking of orders appears to be a good bet. The orders would be identified by color, or possibly a symbol indicating the number of the voluntary program and would be given preference on mill schedules.

Perhaps the most important question in the minds of steel consumers is "where is the increased steel for freight cars, farm equipment, etc., coming from?" Obviously, someone is going to get less. Commerce is fully aware of the fact that, under the new law with its accompanying anti-trust immunity, the steel industry can ask the government to approve a voluntary agreement limiting the amount of steel going to specified industries in order to provide more for the so-called essential products. Such a development could result in boundless confusion.

Another situation being given considerable attention concerns the extent of the allocation agreements, that is, will such agreements cover all components, such as motors, fabricated parts and others for farm equipment, or will allocations be limited to basic raw materials?

Government thinking on this problem is not yet firm, but if the former course is followed, Commerce officials admit that the program may mushroom into a greater administrative monstrosity than OPM, SPAB, PRP, and all of the wartime expedients. On the other hand, if industry agreement cannot be reached voluntarily, the program may amount to exactly nothing due to the absence of direct compulsory powers.

Should the latter situation arise, the Administration will report fully to Congress the efforts made to voluntarily break bottlenecks and increase production, naming recalcitrant industries and companies, as provided for in the law. It is this provision which may assure some degree of success for the voluntary program, according to government sources.

Low Price to Govern Export Licenses Under New Commerce Policy

Washington

• • • **Lowest price rather** than historical position of the shipper will govern issuance of export licenses for most controlled commodities under the next export licensing policy which became effective Jan. 2. The end use of the item exported will also be given consideration.

No item has been added or dropped from the current control list, Director Francis McIntyre, OIT export branch, said in announcing the change of policy. He added that for the first quarter 1948 the new policy would apply to all steel items, coal and coke, cadmium metals and alloys, aluminum houses and most other commodities on the current positive list.

Two main purposes were back of the change, he added. These are conservation of scarce dollar credits and to act as a brake on prices under the new anti-inflation legislation (Senate Joint Resolution 167).

Certain limitations will be placed upon licensing of governmental importing. Unless considered essential to carrying out American trade policies, license preference will be given to private operators. Only under special conditions will foreign governments be permitted to designate one of their own agencies as the consignee.

However, foreign purchasing commissions now established here will be permitted to carry on limited procurement activities. These missions will be required to show compliance with the competitive

Blast Furnace Capacity and Production—Net Tons

	Number of Companies	Annual Blast Furnace Capacity	PRODUCTION							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Pct of Capacity	
			November	Year to Date	November	Year to Date	November	Year to Date	November	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern	11	12,551,280	905,152	9,938,714	28,200	298,065	933,352	10,236,779	90.4	89.1
Pittsburgh-Youngstown	17	25,042,040	1,964,751	20,987,027	25,503	188,512	1,990,254	21,175,539	96.6	92.4
Cleveland-Detroit	6	6,557,500	489,903	5,351,652			489,903	5,351,652	90.8	89.2
Chicago	7	14,097,710	1,038,551	11,498,043	10,436	12,809	1,048,987	11,510,852	90.4	89.2
Southern	8	4,924,670	353,073	3,596,755	14,752	111,818	367,825	3,708,573	90.8	82.3
Western	4	2,536,000	184,861	2,035,830		11,297	184,861	2,047,127	88.6	88.2
Total	37	65,709,200	4,936,291	53,408,021	78,891	622,501	5,015,182	54,030,522	92.8	89.8

Source: American Iron & Steel Institute

nature or low price intent of the policy change.

Importing governments are expected to recommend approvals of license applications; if none are made, OIT will then consider applications almost entirely on the basis of low price and whether the applicant is a private exporter.

Exporters will be required to show evidence of orders; the information must also show specifications and prices to be received. If no price can be shown, the method of determining the price must be explained.

Industry Spokesmen Promise Help in War Against Gray Market

Washington

• • • **A House public** works subcommittee this week was promised the cooperation of the steel industry in the latest Congressional attempt to stop gray market speculation, particularly in the construction industry.

Representatives of eight major steel companies told a gray market investigating subcommittee headed by Rep. Macy, R., N. Y., in a pre-session hearing that the industry is unanimous in its wish to end the steel gray market and will turn over its records to the investigating group.

"We are most anxious to wipe out the gray market, no matter how small it may be, since its mere existence reflects upon the entire industry," the spokesmen told the Macy group. The industry officials said they would make available to the subcommittee any information on tips or actual offers in gray market dealing they have on file.

Rep. Macy declared that as a result of the promised cooperation he hoped to place "quite a number" of steel gray market operators on the witness stand within a month. He said he had received "many letters from interested citizens" and told the producers he hoped interested business men would "continue sending us information that they believe will prove helpful."

Steel, Rep. Macy emphasized, is not the only commodity slated to figure in the new subcommittee's investigations. "There are many other commodities involved, about which our committee already has been given leads for investigation," he stated.

The Macy subcommittee operates under a House-approved resolution authorizing the group to recommend solutions for ending gray market operations. It has wide authority to subpoena witnesses, books, records, correspondence, memoranda, papers, documents and other material as it sees fit. The committee's investigations are being guided by its chief counsel, John T. M. Reddan, who was successful in obtaining convictions of the Garsson brothers while serving in the Justice Dept.

Any recommendations for killing off gray market dealings probably will lie along one or both of two well-traveled avenues of regulation —taxation and antitrust prosecution. In an attack through tax investigations, the subcommittee would ask prosecution for failure to list gray market profits on income tax returns. Antitrust prosecution would be developed from attempts to prove collusion between suppliers and buyers.

The industry finally got off on the right foot in the latest investigation. It told the subcommittee it frankly recognized the existence of a steel gray market, although it rapped reports that from 4 pct to 12 pct of output becomes involved in shady speculation. Spokesmen for the industry summarized their position in these six points:

(1) The percentage of gray market steel is small. This conclusion is supported by the fact that customers have not turned in an unusually large number of offers.

(2) The industry is anxious to wipe out the gray market, no matter how small it may be, as it reflects on the entire industry.

(3) The industry recommends that the subcommittee subpena offerers of gray market steel.

(4) The industry will make available any information, tips, or actual offers.

(5) The industry cannot forecast when the shortage will end. It is opposed to shipping any substantial amounts abroad.

(6) The industry has turned over to the Senate Small Business Committee, the FBI and other government agencies all known instances of gray market profiteering.

Company officials who presented the industry's view at the hearing included C. H. Longfield, Youngstown Sheet & Tube Co.; R. C. Todd, American Rolling Mills Co.; Adam J. Hazlett, Jones & Laughlin Steel Corp.; Bennett C. Chapple, Jr., U. S. Steel Corp.; F. J. Smith, Jr., Inland Steel Co.; J. A. Henry, National Steel Corp. and Weirton Steel Co.; Norman W. Foy, Republic Steel Corp. and M. C. Schrader, Bethlehem Steel Corp.

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HEAVIEST LIFT: *A concrete steel and lead slab weighing approximately 630 tons is started off the ground at the Hunter's Point Naval Shipyards, San Francisco, in the initial lifting test of the world's newest and most powerful crane. This was described as the heaviest lift ever made by man.*

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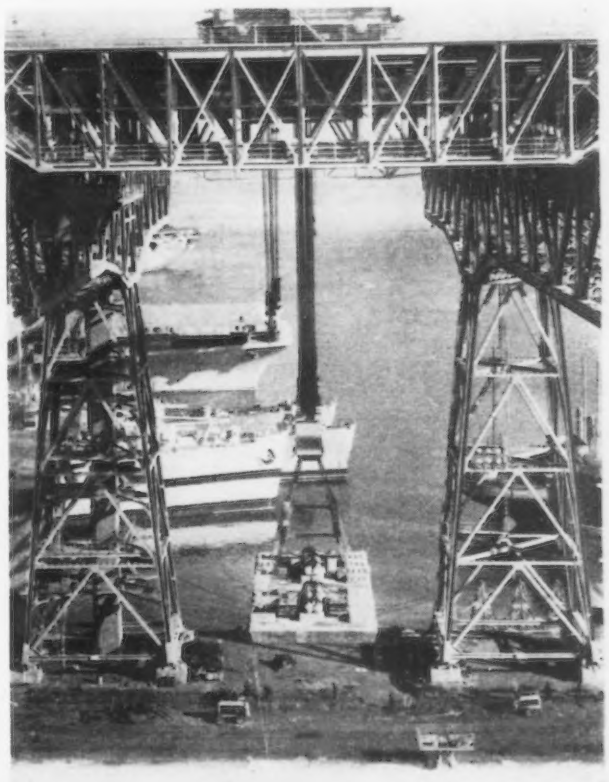

Alloy Steel Customers Still Shuddering at Extra Increases

Similar Carbon Raise Feared As Rolling Costs Are Out of Balance

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By D. I. BROWN
Chicago Regional Editor

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Chicago

• • • **Some alloy steel** consumers are incensed over the last bump in alloy prices. For the most part, however, consumers have accepted the new prices without too much complaint. At the same time, users are fearful lest the drastic hike in alloy size extras means that carbon steel sizes will soon be raised, and this possibility is causing some apprehension. If carbon steel size extras don't go up, it would appear that the pricing experts of steel companies have left themselves open to plenty of criticism regarding the alloy size extras.

Consumers do not understand why certain sizes of alloy bars should cost $20 a ton more to roll than the same size carbon bars, especially when the alloy and carbon rounds in many cases go through the same sets of rolls. Few users are kicking about the increase in open hearth and electric furnace alloy grade extras from $1 to $10 a ton. In open hearth bars the arithmetical average hike was $2.80 a ton on each grade. However, when the producers simultaneously increased alloy bar size extras from $1 to $20 a ton, some consumers claim the steel makers went entirely too far. The average size extra increase in open hearth bars amounts to $11.75 a net ton for each size.

A few companies who never before considered carbon steel suitable for their requirements are now re-investigating every job to see if they can't somehow use the cheaper steel. The big drawback to this program is that the cheaper steel is much harder to obtain. Alloy deliveries have moved out in recent months; however, on the whole, alloy is still a lot easier to get—but at a much bigger price than before.

What started the excitement was Republic Steel's new price cards dated Nov. 17 and 20, 1947. The other makers quickly followed with identical increases. The producers went right down the list and hiked every single grade. Type 6145 and 6150 were given a good boost, although the higher and lower carbons in this same grade did not suffer too much. No increases were made in special quality extras such as bearing, aircraft, etc. The only other price jump, other than grade extras, occurred in size extras of rounds, squares, round cornered squares, hexagons and 4 x 4 to under 7 x 7 blooms and billets. Bar flats as such were not increased.

It would appear after contacting both users and sellers that the steel industry preferred to raise extras rather than base prices. It would also appear that the brunt of the new increases were dumped into the size extra columns. Some producers imply "so what," the overall increase would be the same by any method, but all consumers aren't quite in agreement with this. Producers go further and state that the size extra increases in 1946 should have been much higher than they were. Even with the latest increase some producers declare they are not yet even.

For years alloy users have gaged their requirements in bars with one eye on the break in prices at certain size levels. They felt the old prices were fair and therefore the ratio in cost up or down for different sizes was fundamentally sound and bore a consistent relationship to steel making costs. Now, after looking at the new size extras for a few weeks, they are convinced there is no relationship between the cost of rolling certain sizes of alloy steels and the prices that the sales department charges for them. Part of this thinking is based on the wide differential in size extras between alloy and carbon steels.

Consumers cite that one of the reasons given by the producers for the drastic shakeup in alloy prices late in 1946 was that the producers wanted to straighten out all the inequalities between prices and costs in alloy steel making. Over the years the prices have been allowed to get out of balance when judged on a steel making cost basis. This appeared to be reasonable and consumers believed it. At the moment some consumers are convinced either the last general and drastic price revision was all wrong, or that the alloy makers have suddenly become quite avaricious.

Alloy steel users claim that the reasons for the new prices are manifold. They point to the fairly substantial raises in some of the ferro alloy elements and the extra man hours involved in alloy production, which on the basis of current wage scales has been very costly. They say that the recent increases in price are

Comparison of Size Extras Between Carbon and Alloy Rounds, Squares and Round Cornered Squares

Dollars per hundred lbs.

	Date of Price Card	
	Carbon	Alloy
Size in Inches	3/19/47	11/17/47
¼	$1.30	$2.75
9/32	1.10	2.50
5/16	.95	2.25
11/32	.75	2.00
23/64-13/32	.55	1.55
27/64-15/32	.45	1.35
31/64-35/64	.35	1.15
9/16-19/32	.25	.95
39/64-47/64	.20	.75
¾-31/32	.15	.55
1-1 15/32	.10	.55
1½-1 15/16	none	.50
1 31/32-2½	.10	.50
2 9/16-3 1/16	.20	.60
3⅛-4½	.25	.60
4⅝-5	.35	.60
5¼-5½	.45	.60
5⅝-6	.55	.60
6¼-6½	.65	.70
6¾-7½	.75	.80
7¾	.85	.90
8	1.10	1.10
	Hexagons	
¼-9/32	1.50	3.00
5/16-11/32	1.20	2.45
⅜-13/32	.90	2.05
7/16-15/32	.60	1.60
½-19/32	.35	1.20
⅝-1 9/16	.20	.65
1 19/32-3 1/16	.25	.75
3⅛-3¼	.35	1.50

merely an attempt to bring into line and to recognize to some extent present man hour costs, since some grades were based on operating or production costs before the last two wage increases were granted.

One large producer was asked if lower alloy production was a factor in raising prices. This producer answered that they are making more alloy now than they were before the war. Therefore, the possibility of a higher breakeven point because of less tonnage in alloy being responsible for the new prices is not well founded.

Independent observers are of the opinion that the alloy producers can justify some of the increases recently made. Up until December 1946, alloy steels were sold on practically the same prices as were in existence back in 1939. From 1939 to 1947 the labor statistics bureau of the U. S. Department of Labor reports that the average hourly earnings of workers in the steel mills have increased 77.7 pct. This would indicate that the steel producers waited a little too long to raise their alloy prices, as when they did substantial increases had to be made in order to balance manufacturing costs.

Steel makers also point out that ferro alloys have gone up as much as 40 pct since the last alloy steel increase. One producer laid the new grade extra increase solely at the door of higher ferro alloy cost. This reasoning, observers point out, is somewhat cockeyed, as a good percentage of the alloys contained in the steel tapped from the furnace is charged as alloy steel scrap, most of which is generated by the producers themselves. The recovery of manganese, silicon and chromium in the open hearths is not great but nickel and molybdenum are almost 100 pct recoverable from alloy scrap.

It is the private opinion of some steel executives that the industry is still not current on their alloy steel prices despite the fact that alloy size extras on the average have been increased by 150 pct in the last two years. Alloy grade extras on the average increased 36.8 pct and the base price has gone up 22.2 pct during this same period.

Despite the fact that the new grade extras can possibly be justified by the producers, the wide differentials in the size extras of carbon and alloy steels seems to be bothering many consumers. In the table the extras for both carbon and alloy are listed for rounds, squares and round cornered squares and are on the basis of dollars per cwt. Hexagons are also included in the table. One factor cited by the mills for the increase in size extras is the cost involved in rolling alloy steels, which consumers do not appreciate.

The producers pointed out that when alloy bars are to be made by the double conversion method there are costly slow cooling practices that must be carried out on billet sizes at about 4 x 4 and over depending on grade. In addition to this slow cooling or controlled cooling of alloy rounds over 3 in. in dia off the finishing mill is usually necessary. Alloy consumers who know these facts still insist that the size extras do not bear out such claims. They point to the fact that the biggest differential in size extras between carbon and alloy steel are not on the large size rounds but on the very small sizes. The table seems to substantiate such statements.

After talking to many consumers and the largest producers, it would appear that the consumers aren't as concerned with the new alloy prices as they are over the possibility that the new alloy price card presages additional increases in carbon steel. They are particularly worried about the size extras as they feel that if the new alloy size extras are absolutely correct, it means that an increase in carbon steel size extras is in the offing.

$18.5 Million Coal And Ore Docks Will Open by Next Spring

Toledo, Ohio

• • • **Modern coal** and ore docks costing $18.5 million, being built jointly by the New York Central and Baltimore & Ohio Railroad, will open at this Lake Erie port next spring. The new docks are on Maumee Bay at a location selected for its easy access by lake freighters in all kinds of weather during the navigation season.

The docks will have a capacity for handling 20 million tons of coal and 4½ million tons of ore per yr. Ore will be removed from the lake boats at Toledo and loaded into cars for shipment to steel centers. The new lake facility will have three piers and three slips. Two Hulett ore unloaders will be located on the westernmost of the three piers, and two coal dumping machines will be placed on the center pier. A third coal dumping machine will be located on the easternmost pier. At the time the facility is opened, two of the three coal dumpers and both of the Hulett ore machines will be ready for use.

RACE WITH TIME: *Engineers race against the frigid blasts of winter to lay Canada's Big Inch from newly discovered gas fields at Kinsella to Edmonton 100 miles away. Engineers estimate the Kinsella Reserve contains 1 trillion cu ft of natural gas. The pipe is being placed 4 ft underground as protection against Canada's winters.*

Railroads Get Another Freight Rate Increase of 10 Pct

Washington

• • • **Rail rates** for movement of iron ore, coal and coke have been increased another 10¢ per ton by the nation's railroads, bringing to 20¢ per ton the total temporary increases authorized recently by the Interstate Commerce Commission.

For commodities other than those listed above, the new rates are, on the average, 10 pct higher than those authorized in the previous interim increase.

ICC said the new rates were necessary to help the railroads meet increased costs for wages and materials. It set June 30, 1948, as the expiration date for the temporary increases, thus implying that the carriers' request for permanent rate rises will be acted upon before that date.

Specifically, the commission stated that basic line-haul rates on iron ore, aluminum ore and concentrates, copper ore and concentrates, lead ore and concentrates, and zinc ore and concentrates (classes 309, 311, 313, 315, and 317 of the freight commodity classification) may be increased 20¢ per ton, net or gross as rated, except that no increases are to be made in the line-haul rates on iron ore to or handling charges on iron ore at the upper Great Lakes ports.

The basic line-haul rates on coal and coke, including lignite, are increased 20¢ per net ton or 22¢ per gross ton. When coal, coke, or lignite are transported by water preceded and followed by rail transportation or transported by rail at a combination of two separately established rates, the aggregate amount of the two rail factors shall be considered as the rate to be increased and be subjected to a single increase, ICC said. A single increase will also be applied to rail-barge and barge-rail movements of coal, coke and lignite.

The commission pointed out that under the temporary percentage increases there will be "more instances in which the increases will exceed the maximum holddowns set out in the amended petition."

"The arrangement previously proposed by the carriers, therefore, in connection with the first interim increase should be observed during the pendency of the one here approved, with the further proviso that for iron and steel and the products thereof the maximum should be 11¢ per 100 lbs (or $2.20 per ton, net or gross as rated) as proposed in the amended petition of Dec. 2, 1947, and the same maximum should be observed for aluminum, copper, lead, and zinc and the corresponding products of such nonferrous metals, including scrap," the commission stated.

Steel Traffic Men Now Expect Some Water and Truck Movement Increase

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Pittsburgh

• • • **The freight rate** fences around steel plants have moved closer to the mills. The latest rail rate increase effective Jan. 5 further shortens the radius in which mills find it economical to compete for business. Previous increases have hit customers hard as mills were obliged to drop accounts on which they were absorbing too much freight.

The Interstate Commerce Commission is doing by rate increases what the Federal Trade Commission seeks to do in the courts. It is forcing a closer approach to f.o.b. mill pricing as against the multiple basing point system. Under the latter the basis of steel marketing has been mill competition at various basing points. Higher steelmaking costs combined with rising freight rates have in the past few months cut the lengths to which steel producers feel they can go to meet competition.

In some steel traffic circles there is a feeling that the railroads may be cooking their own goose by making horizontal percentage rate boosts. A noticeable swing to barge and truck shipments is predicted in these quarters. Though barge lines are authorized to increase rates at least two of the larger lines serving Pittsburgh have so far indicated they wouldn't do so. Steel company traffic men are planning now to increase shipments by water. The differential has been sufficiently raised by the ICC action to make this economical.

Wider use of trucks is also anticipated. Within a radius of 350 to 400 miles of the mill trucks now have a very definite advantage in most cases, according to steel traffic men. Combination water and truck shipments are also expected to increase.

To the steel fabricator strategically located to profit by this changeover the rate increase will mean little. To some steel users not so fortunately situated the effect may be serious. As steel company traffic men get more time to analyze the new rates it may be found that freight absorption is causing losses on certain business and these companies may have to find closer supply sources.

WAA Closing Out Program

New York

• • • **War Assets Administration** in this region has a three-point close out program for 1948 to dispose of surplus goods with an original cost value of $500 million. Other objectives of the agency will be to close satellite warehouses and reduce its staff for final completion of its job, according to John R. Campbell, WAA regional director.

He announced that a program of site de-activation would begin early in the year with a corresponding emphasis on special sales at locations to be cleared.

During 1947 the three leading types of buyers of surplus goods in this region were: Wholesalers, 65 pct; manufacturers and other industrial users, 21 pct; veterans, 5 pct.

Steel Keeps West Coast Building Trade Humming

BELOW

Skirts may be getting closer to the ground but bridges are going up. This bridge across Cerritos Channel near Los Angeles rises 200 ft into the air. To allow the largest ocean-going vessels to clear the structure, the 800 ton center span can be raised as high as 125 ft. Weight of the span is counterbalanced by a 400-ton concrete block in each tower.

ABOVE

This gigantic girder was fabricated at Bethlehem Pacific's Alameda Works. By installing the giant girder between the first and second floors of Macy's new building, it will make possible the elimination of several building columns in the basement. Weighing 28 tons, the girder is 62 ft long and 10 ft high.

RIGHT

This twin screw cruiser, built by Roy and Warren Thompson of Oakland, Calif., utilizes 7500 lb of Bethlehem Mayar R. Ten gage sheets are used on the bottom and sides and 12 and 14 gage on the cabin and pilot house. The twin screw craft is powered by two 115 hp engines, while the single screw model has one such unit.

Industrial Briefs . . .

• NEW CORPORATION — Formation of the Eastern Carbide Corp., 909 Main St., New Rochelle, N. Y., has been announced. The company offers a complete line of carbide items including not only the base metal but also finished tools and dies.

• BUYS COAL MINES—Republic Steel Corp. has purchased the Standard Fire Creek Coal Co. and the Fire Creek Fuel Co., Beckley, W. Va., which own and operate coal mines at Beelick Knob and Jon Ben, W. Va. Together these mines comprise roughly 2500 acres of Pocahontas No. 4 and No. 6 coal.

• PURCHASE — Strand Building Products Co. of Detroit, producers of steel garage doors, has been bought in its entirety by Detroit Steel Products Co., Detroit. Operation will continue under the Strand name, maintaining the present organization intact, including the marketing organization.

• CENTENNIAL—In 1948 Whitman & Barnes, Division of United Drill & Tool Corp., Detroit, will celebrate its one-hundredth anniversary. The company is known primarily as a manufacturer of twist drills.

• ZIV EXPANDS — Ziv Steel & Wire Co. has announced the opening of a new branch at 1819 Starr Ave., Toledo. William P. Stead will be manager.

• BALDWIN RETIRES — Robert Taylor Baldwin, of New York, has retired as treasurer of the American Chemical Society on Dec. 31 after 16 years of service in this post. He will continue as chairman of the society's Finance Committee.

• CHANGES NAME—The Nonferrous Ingot Metal Institute, Chicago, has changed its name to Brass & Bronze Ingot Institute.

• AWARDED MEDAL—Mason Britton, president, Metal Cutting Tool Institute, has been awarded the Medal for Merit by the President of the United States for outstanding service in World War II.

• WEST COAST SUBSIDIARY—The Air Reduction Co., New York, has formed a new wholly owned subsidiary, the Air Reduction Pacific Co., 220 Bush St., San Francisco 4.

• ENGLISH AFFILIATE—Syncro Machine Co., Perth Amboy, N.J., manufacturers of machinery for every wire drawing need, has announced their new English affiliated company, Winget-Syncro, located at Rochester, Kent, England.

• ALUMINUM WAREHOUSE—Levinson Steel Sales Co., Pittsburgh, has been appointed warehouser and distributor for the Aluminum Sales Div., Reynolds Metals Co., in the Tri-State industrial area.

• SILVER JUBILEE—Goss & deLeeuw Machine Co., Kensington, Conn., is celebrating the twenty-fifth anniversary of its founding.

• MOVES WEST—E. F. Wright Steel & Wire Co. of Worcester, Mass., has purchased a Chicago warehouse. The one-story building cost $90,000, and contains 15,000 sq ft of storage space.

• $10 MILLION PROGRAM — United Engineers & Constructors, Inc., Philadelphia, and the Fraser-Brace Engineering Co., New York, have been awarded contracts for building a new research center and expanding manufacturing facilities of the National Aniline Div. of the Allied Chemical & Dye Corp. in Buffalo. Cost of the program is estimated at $10 million.

Steel Has "New Look"; Can't Stand Still, Says Corp.'s Research Chief

Pittsburgh

• • • **The "new look"** in the steel industry embraces a host of new technological developments, Dr. R. E. Zimmerman, vice-president, research and technology, U. S. Steel Corp., told the Engineer's Society of Western Pennsylvania here recently. The changes, some of which came with the war and many more from laboratories and drafting boards before the war, have been made to satisfy growing requirements of fabricators and consumers of steel products, he asserted.

"Steel cannot stand still, even if its sponsors and manufacturers so desired," said the research scientist, who supervises U. S. Steel's technological activities. "The steel industry therefore has engaged in study and research, as did its customers, so that new and improved steel products might contribute their fair share to the general advancement."

Among parallel developments leading to steel's advance to the position of a universal industrial material, he listed autogenous welding and cutting, highly developed apparatus for cold stamping, forming and drawing; vitreous enameling, the long list of high-speed machine tools, as well as an ample supply of power for industrial purposes.

As a result of study and endless experimentation, said Dr. Zimmerman, "steel processes today are better understood, better controlled and better conducted." Arising from "the new philosophy of steelmaking and heat treatment," he asserted, steel products are more readily made to perform specific services in industry for the ultimate benefit of the final user of steel products.

Among "striking trends" in steel demands, Dr. Zimmerman pointed to the vastly increased requirements for flat rolled products —sheets, tinplate, strip and plates. Producers, he said, have modernized their processes and expanded their capacities to meet oncoming developments, but the pressure from the consuming side is still strongly felt.

Weekly Gallup Polls . . .

Both GOP and Democrats Give Wide Support to Tariff Cuts

Princeton, N. J.

• • • **The ancient and** traditional difference between the Democratic and Republican parties on the tariff issue has melted away so far as the rank and file of voters themselves are concerned, according to George Gallup, director, American Institute of Public Opinion.

Every schoolboy learns from his history books that, traditionally, the Democrats stood for low tariffs, the GOP for high tariffs. But the 23-nation agreement recently signed by the United States at Geneva, lowering tariffs next year on many products, gets just as widespread support from Republican voters as from Democrats. In short, one cannot today tell a Democrat from a Republican so far as attitude toward tariffs is concerned.

That's the conclusion from a coast-to-coast survey of public opinion conducted by the institute. The study shows that about a third of the voters have heard or read about the 23-nation Geneva agreement, in which the participating countries agreed to revise their tariff rates downward. For the United States it was the biggest tariff revision in our history.

To record the reaction of the whole voting population on the issue, the institute gave each voter a brief description of the Geneva agreement, so that the views of both those who had previously heard about it and those who had not could be ascertained.

The question was:

"Twenty-two foreign nations have agreed, starting next year, to allow certain U.S. products to come into their countries at lower tariff rates and we, in return, have agreed to let certain of their products come into this country at lower tariff rates. Do you favor or oppose this?"

The vote:

	Pct
Favor	63
Oppose	12
No opinion	25

Old sectional differences on the tariff seem to have partly melted away, too. The survey finds majorities ranging from 53 to 68 pct in the various geographical sections favoring the Geneva agreement.

By occupation groups, the smallest support comes from farmers, only 52 pct of whom approve the agreement, while 15 pct disapprove and 33 pct express no opinion.

As pointed out above, approximately one-third of the people polled had already heard or read about the Geneva agreement. A higher percentage of them expressed approval than was the case with the country as a whole. A total of 73 pct said they favored the agreement, as compared to 63 pct for the nation.

The Geneva agreement went into effect Jan. 1. The United States reduced the tariff on raw wool and wool products and whisky from the United Kingdom and on many other items. In exchange, a number of nations granted the United States trade concessions on some grains, cereal products, fresh and dried fruits, canned fruits, dairy products, tobacco, automobiles and parts and machinery. We also agreed to reduce or peg import duties on such items as rubber, cocoa, chinaware, linen goods, cattle, fish, cheese, potatoes and wood pulp.

Some members of Congress believe that when the full force of the Geneva tariff slashes are felt by American industry and agriculture, there will be an outcry from businessmen and farmers. Rep. Harold Knutson of Minnesota, chairman of the House Ways and Means Committee, has already voiced the belief that a reaction against the tariff cuts may set in.

•

• • • **The high - cost - of - living,** American relations with Russia, and the Taft-Hartley labor relations law were the three most interesting news stories of 1947 in the opinion of American voters. The cost of living led the voting by a big margin.

Public Names High Prices, Cold War, Taft-Hartley Act As Top News Events of 1947

o o o

After the top three come the Marshall Plan for aid to Europe, Palestine partition, and the investigation of communism in Hollywood by the House Committee on Un-Americanism.

A noticeable feature of the list is the prominence given to "continuing" stories, rather than spot news events. Admittedly, we have not heard the last of either of the first five.

A nationwide survey was made by the institute of representative voters who were handed a list of 24 important news stories of the year and asked: "Which of the following news events interested you the most?"

Following are the 15 most frequently mentioned in order of votes received:

High cost of living
Russian-American conflict
Marshall Plan
Taft-Hartley Labor Law passage and litigation
Palestine Partition Plan
Investigation of Hollywood communism
John L. Lewis' difficulties with government
Princess Elizabeth's wedding
School teachers' strikes
Texas City, Texas, disaster
Hughes-Meyers investigation
Truman food-saving program
Telephone strike
Long skirts
Battle of Georgia governors

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

1495 **Tons,** Mobile, Ala., Alabama State Docks expansion, to Virginia Bridge Co., Birmingham, through Rust Engineering Co., Birmingham.

435 **Tons,** El Centro, Calif., superstructures for steam station and pumping station, to National Iron Works, San Diego.

145 **Tons,** Prairie County, Mont., bridge FI. 130-10 for the State of Montana to W. P. Roscoe Co.

120 **Tons,** Chicago, North State St. viaduct to Truseon Steel Co., Youngstown.

• • • **Fabricated steel inquiries** this week included the following:

600 **Tons,** District of Columbia, Potomac River bridge.

540 **Tons,** St. Paul, bridge 4514 for the State of Minnesota, bids close Jan. 9.

200 **Tons,** Chicago, Chicago and Northwestern RR, 110-ft deck plate girder span.

130 **Tons,** Red Lake, Minn., bridge 3986 for the State of Minnesota, bids close Jan. 9.

• • • **Reinforcing bar awards** this week included the following:

1500 **Tons,** Thermopolis, Mo. Boysen Dam and power house through Morrison Knudeson Co., Boise, Idaho, to Sheffield Steel Co., Kansas City.

480 **Tons,** Clayton, Mo., St. Louis County Court House to Laclede Steel Co., St. Louis, through H. B. Deal Co., general contractors.

460 **Tons,** Mobile, Ala., Alabama State Docks expansion, to Connors Steel Co., Birmingham, through Rust Engineering Co., Birmingham.

200 **Tons,** Cedar Rapids, Iowa, power house Iowa Light & Power Co. to Iowa Steel & Iron Works, Cedar Rapids.

110 **Tons,** El Centro, Calif., superstructures for steam station and pumping station, to Bethlehem Steel Co., Bethlehem.

• • • **Reinforcing bar inquiries** this week included the following:

2350 **Tons,** Harlan County, Ky., dam, bids due Jan. 29 by U. S. Engineers, Kansas City.

1200 **Tons,** Tenkiller, Okla., dam, bids due Jan. 6 by U. S. Engineers, Tulsa.

1000 **Tons,** Fort Wayne, Ind., U. S. Veterans' Hospital, previously reported, has been postponed. New bids will be taken Jan. 9.

810 **Tons,** Poplar Bluff, Mo., U. S. Army hospital M. A. Port Carlo Construction Co., St. Louis, low bidder.

500 **Tons,** Hulah, Okla., dam, bids due Jan. 19 by U. S. Engineers, Tulsa.

470 **Tons,** Chicago, Bond St. store, bids closed Jan. 5, was previously reported in error at 200 tons.

430 **Tons,** Springfield, Ill., power house for the State of Illinois, Alzina Construction Co., Springfield, low bidder.

365 **Tons,** Milwaukee, warehouse, Pittsburgh Plate Glass Co. Bids closed Jan. 7.

120 **Tons,** Chicago, Dearborn St. subway project T-9B, Leininger Construction Co., Chicago, previously reported low bidder, has been awarded the contract.

120 **Tons,** Chicago, St. Constantine church, previously reported, has been postponed on account of high cost.

115 **Tons,** Nyssa, Ore., Locket Gulch wasteway, Owyhee Project, Bureau of Reclamation, Denver, Spec. 2052, bids to Jan. 14.

WAA Field Offices To Offer $300 Million In Surplus Machine Tools

Washington

• • • **WAA field offices** have been instructed to push sales of surplus machine tools, through both fixed prices and competitive bidding, immediately following completion of JANMAT selections at each warehouse. No large offerings have been made since last September.

About $300 million worth of machine tools out of a cumulative inventory of $1.3 billion remain in WAA hands for disposal, the agency said. Well over $1 billion worth has been sold, donated to schools and training institutions, or earmarked by JANMAT for the national defense reserve.

Two-thirds of the quantity needed for the military stockpile has been acquired as of January 1, JANMAT officials told THE IRON AGE. Approximately 62,000 items have been inspected and accepted, leaving 30,000 still to be acquired.

Work of inspecting and tagging has been speeded up, it was added, until the JANMAT field teams are acquiring equipment at the rate of 1000 items a week.

Under the new istructions, as soon as the military teams complete inspection and tagging at each WAA location the remainder will be offered at fixed prices for a 45-day period. Priority buyers only may buy during the first 15 days.

Competitive bids will be accepted during the last 30 days of the inspection period but awards will not be made until expiration of the 45-day period. Any stocks remaining after the fixed price and competitive bid sales period will be offered in carload lots to all clases of bidders.

Add Items to Export List

Washington

• • • **Forty-six more** classifications of steel mill products were added last week to the positive export list by the Office of International Trade (THE IRON AGE, Dec. 11, 1947, p. 136), bringing the total steel manufactures requiring export licenses to about 97 pct.

The amendment to the general regulations, effective as of January 1, does not apply to shipments in transit to ports of exit, on dock, or on board vessels.

Buys Machine Tool Co.

Cincinnati

• • • **The King Machine** Tool Co. of Cincinnati has been purchased by American Steel Foundries of Chicago. This purchase marks the entry of the Chicago firm into the machine tool business, and will give it a wide diversification of products ranging from basic parts for building and repairing railway cars to malleable iron and brass castings.

Coming Events

Jan. 12-16 **Society of Automotive Engineers,** annual meeting, Detroit.
Jan. 12-16 **National Materials Handling Exposition,** Cleveland.
Jan. 18-20 **Stoker Institute of Canada,** annual meeting, Mount Royal Hotel, Montreal, Canada.
Jan. 19-20 **Institute of Scrap Iron & Steel, Inc.,** annual convention, Chicago.
Jan. 21-24 **American Society of Civil Engineers,** annual meeting, New York.
Feb. 10-11 **Pressed Metal Institute,** annual meeting, Buffalo.
Feb. 15-19 **American Institute of Mining and Metallurgical Engineers,** annual meeting, New York.
Mar. 3-5 **Society of Automotive Engineers,** national passenger car meeting, Detroit.
Mar. 15-19 **ASTE Industrial Exposition,** Cleveland.
Mar. 18-19 **Magnesium Assn.,** annual meeting, New York.
Apr. 5-8 **Southern Machinery and Metals Exposition,** Atlanta.
Apr. 5-8 **National Assn. of Corrosion Engineers,** annual conference and exhibition, St. Louis.
Apr. 12-14 **Openhearth Steel Committee and Coke Oven, Blast Furnace and Raw Materials Committee, AIME,** annual conference, Pittsburgh.

Cleveland Host For National Materials Handling Exposition

Cleveland

• • • **An outstanding** aggregation of top experts in the field of materials handling will be on hand to lead discussion at the Second National Materials Handling Exposition to be held in the Cleveland Public Auditorium Jan. 12-16, **inclusive.**

To be held concurrently with the Exposition on Jan. 13 and 14 is a special national session of the Materials Handling and Management Divs. of the American Society of Mechanical Engineers, according to an announcement by Curtis H. Barker, Jr., vice-president of Pallet Sales Corp., New York, and secretary of the A.S.M.E.

In addition to the 14 discussion topics, major theme of which is expected to be cost reduction through improved handling, listed on the program, inspection tours of outstanding Cleveland plants are included in the schedule. With material and labor costs at an all-time high, reductions in the cost of handling represent one of the few departments still open to substantial savings. Discussions are expected to cover all phases of the handling operations from the viewpoint of manufacturer, distributor, jobber and retailer. The problems of warehousing and shipping will be included in the discussions.

When the exposition committee met recently in Chicago, Chairman E. J. Heimer reported that the entire 75,000 sq ft of exhibition space at the Cleveland Public Auditorium had been contracted for and an additional 17,000 sq ft in an adjoining hall. The committee hopes that still another 17,000 sq ft may be made available to accommodate incoming exhibitor requests.

Products and systems exhibited will include latest models of conveyors, hoists, monorails, portable elevators, stacking units, tractors, trailers, all types of industrial trucks, skids, pallets and accessories. The number of exhibitors is expected to exceed 200.

Included in the list of topics to be discussed are: "Factors and Their Evaluation for Determining Economies of Materials Handling Systems," "Standardization of Materials Handling Equipment," "Integrating the Use of Different Types of Handling Equipment," "Freight Elevator Applications," "Planning a Storeroom Operation," "Planning the Pallet System," "Handling Unusual Shapes," and "Planned Packaging for Efficient Handling."

Other topics include: "Loss and Damage Prevention Through Improved Materials Handling," "Coordinating Traffic and Materials Handling," "The Plant Materials Handling Engineer — His Value, Duties and Authorities," "Procedure for Making a Materials Handling Survey," "Materials Handling Factors in Plant Layout" and "Time and Motion Techniques in Materials Handling."

In addition to the above discussions motion pictures covering a variety of materials handling subjects will be shown.

Electrical Equipment Ordered for Oil Line Running Into Illinois

Philadelphia

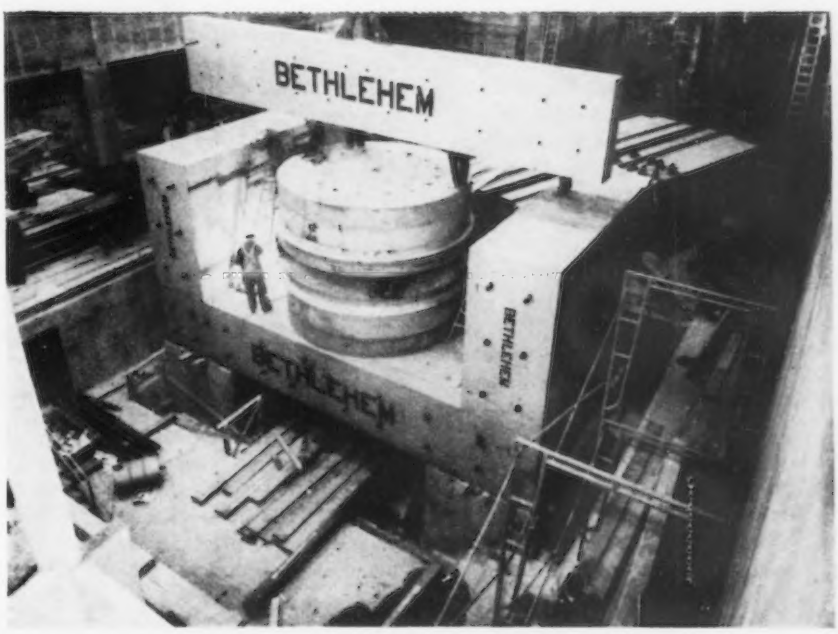
• • • **A contract to** furnish all electrical equipment for a new crude oil pipe line in which Shell Pipe Line Corp. and the Texas Pipe Line Co. will own undivided interests has been awarded to Westinghouse. The line will originate at Cushing, Okla., and have terminals at Wood River and Salem, Ill.

The approximate thruput capacity of 200,000 bbl per day makes this one of the largest oil pipe lines to be built by private capital. More than 35,000 hp in electric motors will be required to power the eight pumping stations. At each station, three 1250-hp motors and a 700-hp motor will drive the main pumping units, and a number of smaller motors will be required for auxiliary services. Power will be delivered through eight outdoor substations composed of three 1667-kva transformers and related switching equipment.

Simultaneously Shell will install not less than 5000 hp of electric motors to replace the diesel engines on its existing 10-in. lines between Cushing and Wood River.

Shipment of the electrical equipment is to start early in the fall of 1948. The pipe line is scheduled for completion in the first quarter of 1949.

FOR ATOM SMASHER: *Workmen at Columbia University's new nuclear physics research center at Nevis, Irvington-on-Hudson, N. Y., progress with installation of a huge steel magnet in the 2500 ton cyclotron. When completed the unit is expected to accelerate protons to an unprecedented energy of 400 million volts, which scientists say is enough to smash any atom into its component parts.*



The Iron Age Metalworking Buyer's Guide

. . . A second section of the Buyer's Guide is presented herewith. The first section of this directory appeared in the Annual Review Issue of Jan. 2, p. 208. This guide has been prepared from a file of names built up over the years which is believed to be completely functional. Product and equipment headings are broken down into as fine classifications as deemed practicable . . . Send in corrections for the Buyer's Directory.

Bearings

Allison Div., General Motors Corp., Indianapolis 6.

American Brake Shoe Co., 230 Park Ave., New York 17.

American Non-Gran Bronze Co., Berwyn, Pa.

Ampco Metal Inc., 1745 So. 38th St., Milwaukee.

Auburn Ball Bearing Co., P. O. Box 3030, Dept. C, Rochester 14, N. Y.

Bartlett, C. O., & Snow Co., 6200 Harvard Ave., Cleveland 5.

Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.

Chrysler Corp., P. O. Box 2718, Detroit 31.

Dakon Tool & Machine Co., Inc., 498 Broadway, Brooklyn 6.

Dodge Manufacturing Corp., Mishawaka, Ind.

Hartford Steel Ball Co., New Park Ave. & Jefferson St., Hartford 6.

Hyatt Bearings Div., General Motors Corp., Harrison, N. J.

Jack & Heintz, Inc., Cleveland 1.

Kaydon Enginering Corp., McCracken St., Muskegon, Mich.

Keystone Carbon Co., Inc., 1935 State St., St. Marys, Pa.

Lumen Bearing Co., 197 Lathrop St., Buffalo 12.

Mallory, P. R. & Co., Inc., 3029 E. Washington St., Indianapolis 6.

Marlin-Rockwell Corp., Plainville, Conn.

McGill Manufacturing Co., Inc., Bearing Div., Valparaiso, Ind.

Moraine Products Div., General Motors Corp., 1420 Wisconsin Blvd., Dayton 1.

Morganite Brush Co., Inc., 3302-3320 48th Ave., Long Island City 1, N. Y.

Mueller Brass Co., 1925 Lapeer Ave., Port Huron, Mich.

National Carbon Co., Inc., 30 E. 42nd St., New York 17.

National Lead Co., 111 Broadway, New York 6.

Randall Graphite Products Corp., 609 W. Lake St., Chicago 6.

Royersford Foundry & Machine Co., Inc., Main St., Royersford, Pa.

SKF Industries, Inc., Front St. & Erie Ave., Philadelphia 34.

Timken Roller Bearing Co., Canton 6, Ohio.

Torrington Co., Bantam Bearings Div., 3702 W. Sample St., So. Bend 21, Ind.

Triangle Mfg. Co., Oshkosh, Wis.

Westinghouse Electric Corp., East Pittsburgh, Pa.

Bearings, Anti-friction

Ahlberg Bearing Co., 3025 W. 47th St., Chicago 32.

American Brake Shoe Co., 230 Park Ave., New York 17.

American Roller Bearing Co., 416 Melwood Ave., Pittsburgh 13.

Atlantic Gear Works, Inc., 200 Lafayette St., New York.

Auburn Ball Bearing Co., P. O. Box 3030, Dept. C, Rochester 14, N. Y.

Bartlett, C. O., & Snow Co., 6200 Harvard Ave., Cleveland 5.

Bower Roller Bearing Co., 3040 Hart St., Detroit 14.

Dakon Tool & Machine Co., Inc., 498 Broadway, Brooklyn 6.

Dodge Manufacturing Corp., Mishawaka, Ind.

Fafnir Bearing Co., Booth St., New Britain, Conn.

Hyatt Bearings Div., General Motors Corp., Harrison, N. J.

Jack & Heintz, Inc., Cleveland 1.

Kaydon Engineering Corp., McCracken St., Muskegon, Mich.

Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.

McGill Manufacturing Co., Inc., Bearing Div., Valparaiso, Ind.

Miniature Precision Bearings, Inc., Keene, N. H.

National Lead Co., 111 Broadway, New York 6.

New Departure Div., General Motors Corp., Bristol, Conn.

50 YEARS AGO

THE IRON AGE, *January 6, 1898*, Outlook for 1898

• "Generally speaking, the prospects for the new year in the iron trade are most encouraging. With wheat above the dollar mark, the tariff policy settled for some time to come, a large tonnage already on the books of large concerns and stocks on hand very light, it would seem that good trade should set in early in the year. Everything points to big tonnage at fairly profitable prices."

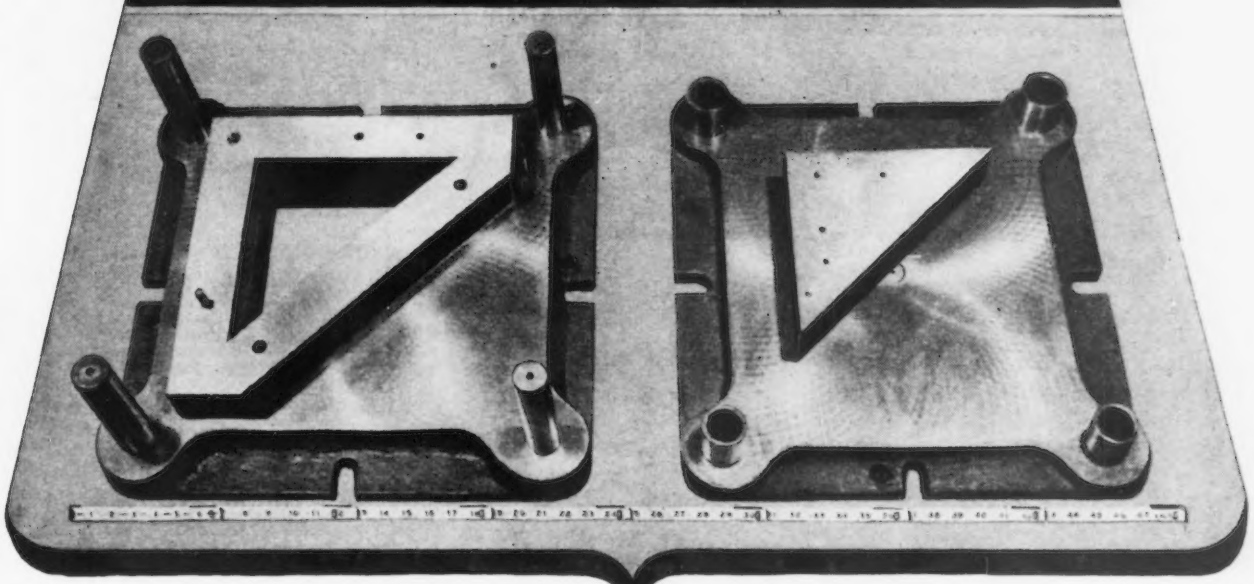
• "Electric vehicles have made considerable headway abroad. So far, the automobile vehicle in this country has been confined mainly to the limits of an experiment. Fourteen electric cabs for public service were started early in the year in New York City by the Electric Carriage & Wagon Co. and have been running with fair success. It is expected that 50 electric coupes and an equal number of hansom cabs will be in operation by spring."

• **"A profit sharing plan on a large scale has been inaugurated this week by the largest department store in Boston. The firm will allow employees 1 pct of their individual sales in addition to regular salaries. By this means they expect to give them additional incentive to make sales and work in the interests of the firm."**

• "Recent experiments with petroleum as fuel for small vessels at the Brooklyn Navy Yard have been so successful that the Navy has given directions for trials on a larger scale of two distinct types of firing. One torpedo boat will be fitted with a system of burners through which oil is fed into the furnaces by compressed air. A similar vessel will be equipped with a system in which a steam blast is used to vaporize and burn the oil."

• **"The tremendous preponderance of exports in our foreign commerce is a frequent subject of congratulations in trade circles. The balance of trade for this year which is estimated at $350 million in favor of this country will surpass all previous records. It is little wonder that American bankers are loaning money in Europe."**

DISSTON CROLOY AIR HARDENING STEEL



FOR HIGH WEAR RESISTANCE AND LONG PRODUCTION RUNS

THE patented analysis of Disston Croloy, plus the exercise of great care in melting, rolling and annealing, have resulted in the production of a tool and die steel of exceptional service qualities.

Croloy provides very high resistance to wear, both sliding and impinging. It is unsurpassed for cold working tools and dies, for long run operations and for achieving a high degree of accuracy in the finished product.

Though Croloy possesses air hardening properties, it machines more easily than other high-carbon, high-chrome steels. And it produces a uniform hardness and fine grain throughout all sections of the tool or die.

Use Croloy for dies used in blanking, drawing, extrusion, forming, lamination and thread-rolling. Use it as a hob steel for the making of plastics molds. Use it for punches, shears, planer knives, slitting cutters, gauges and similar items. And wherever used, you can count on Croloy for dependable performance, long wear and economy.

ANALYSIS

Carbon	1.50%
Chromium	12.00%
Vanadium	1.00%
Molybdenum	.80%

(Produced Under Patent No. 1,695,916)

ESTABLISHED 1840 TRADE MARK REG. U.S. PAT. OFF.

CONSULT DISSTON ENGINEERS

Regarding Your Tool Steel Problems

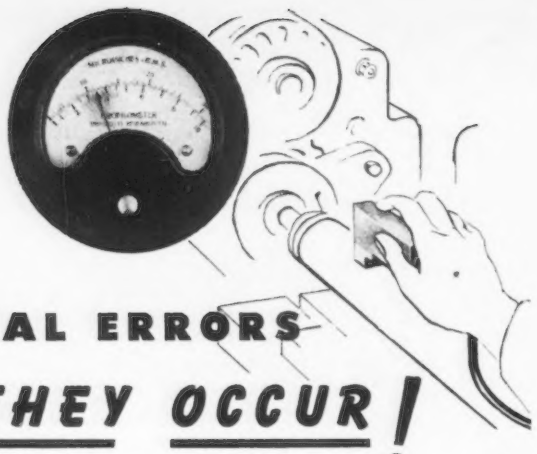
They will be glad to make available to you their vast experience in the production of tool steels for applications of every kind.

STEEL

Everybody who wants to obtain steel can help himself to get it by immediately starting scrap into the channels that serve steel mills.

HENRY DISSTON & SONS, INC., 119 Tacony, Philadelphia 35, Pa., U. S. A.

This Simple Shop Instrument SHOWS DIMENSIONAL ERRORS *BEFORE THEY OCCUR!*



Dimensional errors can be detected *in advance* through a new method of quality control—a proven technique offering tremendous savings wherever parts are produced in quantity by machining operations. Here, in brief, is the story:

When a cutting tool or grinding wheel begins to grow dull, clean cutting action ceases and the metal begins to be *torn* off. As a result, (1) there is an *increase in surface roughness;* and (2) *dimensional errors* are introduced. Once begun, this effect increases rapidly, frequently leading to defective work before it can be detected by dimensional gaging.

The very *start* of poor cutting action is indicated by an *increase in surface roughness* somewhere along the work. This "starting-point" is quickly determined by taking Profilometer readings, *right on the production line* or even in the machine. Impending dimensional errors are thus detected *before they occur,* and consequently are easily prevented.

The Profilometer gives a direct meter reading of surface roughness in microinches. It can be used on practically any surface that can be produced by normal machining or grinding methods. Used for predetermining errors as described above, its initial cost is soon repaid by savings in production time and elimination of rejects; and that is only *one* of its applications.

May we send you descriptive literature?

The PROFILOMETER
TRADE NAME REGISTERED

PHYSICISTS RESEARCH COMPANY

ANN ARBOR • MICHIGAN

BUYERS GUIDE

Omega Ball Bearing Co., Inc., 189 Cottage St., Poughkeepsie, N. Y.

Rollway Bearing Co., Inc., 541 Seymour St., Syracuse 4, N. Y.

Royersford Foundry & Machine Co., Inc., Main St., Royersford, Pa.

SKF Industries, Inc., Front St. & Erie Ave., Philadelphia 34.

Spaulding Fibre Co., Inc., Tonawanda, N. Y.

Split Ballbearing Corp., Lebanon, N. H.

Timken Roller Bearing Co., Canton 6, Ohio.

Torrington Co., Bantam Bearings Div., 3702 W. Sample St., So. Bend 21, Ind.

Tyson Bearing Corp., Massillon, Ohio.

Bearings, Babbitted

Link-Belt Co., 300 W. Pershing Rd., Chicago 9.

Bearings, Ball or Roller

American Roller Bearing Co., 416 Melwood Ave., Pittsburgh 13.

Bearings Co. of America, 500 Harrisburg Ave., Lancaster, Pa.

Fafnir Bearing Co., Booth St., New Britain, Conn.

Federal Bearings Co., Inc., West Poughkeepsie, N. Y.

Kaydon Engineering Corp., McCracken St., Muskegon, Mich.

L & S Bearings Co.,

Hyatt Bearings Div., General Motors Corp., Harrison, N. J.

Marlin-Rockwell Corp., 402 Chandler St., Jamestown, N. Y.

New Departure Div., General Motors Corp., Bristol, Conn.

Nice Ball Bearing Co., 2900 Hunting Park Ave., Philadelphia 40.

Rollway Bearing Co., Inc., 541 Seymour St., Syracuse 4, N. Y.

SKF Industries, Inc., Front St. & Erie Ave., Philadelphia 34.

Shafer Bearing Co., 1400 Washington Blvd., Chicago.

Timken Roller Bearing Co., Canton 6, Ohio.

Torrington Co., N. Sample Blvd., South Bend 21, Ind.

Bearings, Carbon, Graphite

National Carbon Co., 30 E. 42nd St., New York 17.

United States Graphite Co., Saginaw, Mich.

Bearings, Molded Fiber

Gatke Corp., 228 N. LaSalle St., Chicago 1.

National Vulcanized Fibre Co., Beach St., Wilmington 99, Del.

Bearings, Needle

McGill Mfg. Co., Valparaiso, Ind.

Roller Bearing Co. of America, Whitehead Ave., Trenton, N. J.

Torrington Co., Torrington, Conn.

Bearings, Rolling Mill

Link-Belt Co., Ball & Roller Bearing Div., Holmes Ave., Indianapolis.

Mesta Machine Co., P. O. Box 1466, Pittsburgh 30.

Timken Roller Bearing Co., Canton 6, Ohio.

Bearings, Self Lubricating

Bound Brook Oil-Less Bearing Co., Lincoln Blvd., Bound Brook, N. J.

Chrysler Corp., Amplex Div., Harper Ave., Detroit.

Lignum-Vitae Products Corp., 96-100 Boyd Ave., Jersey City 4.

Bearings, Sleeve Type, Bronze

Barium Metals Corp., 258 State St., Rochester, N. Y.

Buckeye Brass & Mfg. Co., 6410 Hawthorne Avenue, Cleveland 3.

THE Sides OF A V-BELT

Diagram of V-Belt in Sheave-Groove

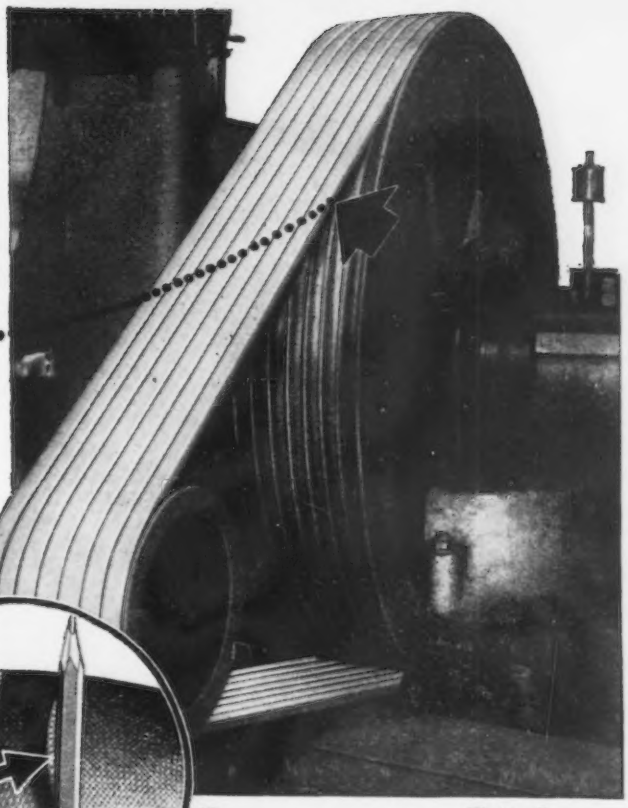
ARE WHAT

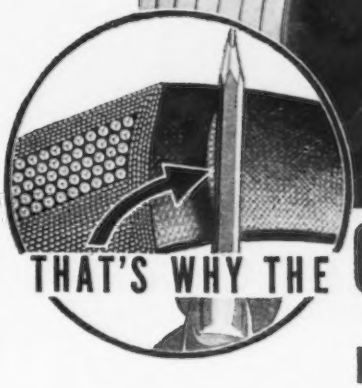
Grip the Pulley,

Pick-up the Load

AND REALLY

Get the Wear!





THAT'S WHY THE Concave Side

(A GATES PATENT)

IS IMPORTANT TO YOU!

Every ounce of load a V-Belt carries must *first* be picked up by the *sides* of the belt. Clearly so, because *only* the *sides* come into contact with the pulley! The sides do all the *GRIPPING* on the pulley. They get all the wear against the sheave-groove wall. The sides *pick up* the load. They transmit that load to the belt as a whole. And then, once more, the sides—and the sides *alone*—grip the driven pulley and *deliver* the power to it.

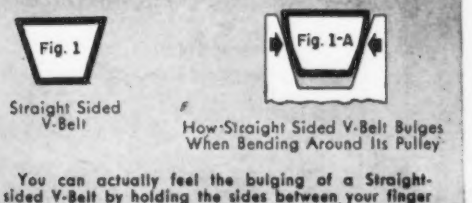
That is why you have always noticed that the sidewall of the ordinary V-Belt is the part that wears out first.

Clearly, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt—and that's why the patented Concave Side is important to you.

The simple diagrams on the left below show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the *middle* of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

and the CONCAVE SIDE is more important NOW than ever before!

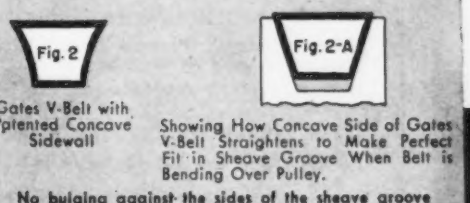
Now that Gates SPECIALIZED Research has resulted in Super Vulco Ropes capable of carrying much heavier loads—fully 40% *higher horsepower ratings*—the sidewall of the belt is called upon to do even more work in transmitting these heavier loads to the pulley. Naturally, with heavier loading on the sidewall, the life-prolonging Concave Side is more important *now* than ever before!



Straight Sided V-Belt

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a Straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.



Gates V-Belt with Patented Concave Sidewall

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt is Bending Over Pulley.

No bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

Gates

The Mark of SPECIALIZED Research

THE GATES RUBBER COMPANY

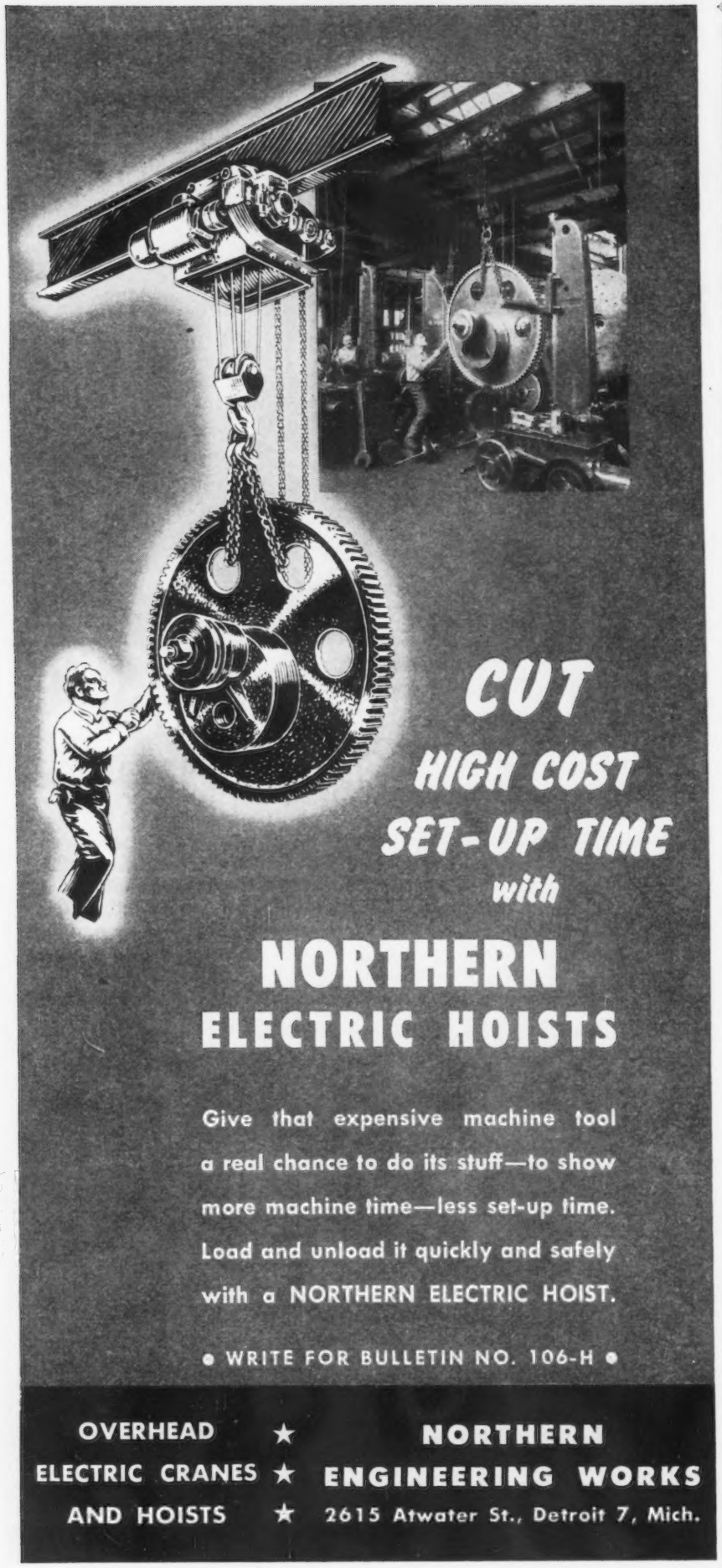
"The World's Largest Makers of V-Belts"

DENVER, U. S. A.

481

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks **IN ALL INDUSTRIAL CENTERS** of the U. S. and 71 Foreign Countries


CUT
HIGH COST
SET-UP TIME
with
NORTHERN
ELECTRIC HOISTS
Give that expensive machine tool a real chance to do its stuff—to show more machine time—less set-up time. Load and unload it quickly and safely with a NORTHERN ELECTRIC HOIST.
• WRITE FOR BULLETIN NO. 106-H •
OVERHEAD ★ ELECTRIC CRANES ★ AND HOISTS ★
NORTHERN ENGINEERING WORKS
2615 Atwater St., Detroit 7, Mich.

BUYERS GUIDE

Johnson Bronze Co., 505 S. Mill St., New Castle, Pa.

Beds, Cooling, Merchant Mill

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh 1.

Bells and Hoppers, Blast Furnace

Pittsburgh Steel Foundry Corp., Glassport, Pa.

Belting and Belt Drives

Allis-Chalmers Mfg. Co., Milwaukee 1.

Gates Rubber Co., 1000 S. Broadway, Denver.

Hewitt Rubber Corp., Buffalo 5.

Minnesota Mining & Mfg. Co., Fauquier Ave., St. Paul 6.

Rhoads, J. E., & Son, 35 N. 6th St., Philadelphia 6.

Schieran, Chas. A., Co., 30-38 Ferry St., New York.

Belting, Conveyer

Fabreeka Products Corp., Inc., 222 Summer St., Boston 10.

Main Belting Co., Philadelphia.

Quaker Rubber Corp., Comly & Milner Sts., Philadelphia 24.

Belting, Conveyer, Metal

American Manganese Steel Div., American Brake Shoe Co., 375 E. 14th St., Chicago Heights, Ill.

Cyclone Fence Div., American Steel & Wire Co., Waukegan, Ill.

Industrial Heating Equipt. Co., 3570 Fremont Pl., Detroit 7.

Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.

Sandvik Steel, Inc., 111 8th Ave., New York 11.

Smith Power Transmission Co., 1545 E. 23rd St., Cleveland 14.

Stanhope, R. C., Inc., 60 E. 42nd St., New York 17.

Sterling Alloys, Inc., Woburn, Mass.

Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., 500 Fifth Ave., New York 18.

Belting, Leather

Rhoads, J. E. & Son, 35 No. 6th St., Philadelphia 6.

Schieren, Chas. A. Co., 30-38 Ferry St., New York.

Belting Transmission

Akron Belting Co., 70-74 S. Canal St., Akron 8, Ohio.

Brown, Arthur S. Mfg. Co., Tilton, N. H.

Fabreeka Products Co. Inc., 222 Summer St., Boston 10.

Philadelphia Belting Co., Filbert St., Philadelphia 7.

Belt Polishing Machines (See Polishing Machines, Belt)

Belts, Abrasive (See Abrasive Polishing Belts)

Belts, Canvas, Polishing

Allied Industrial Products Co., 620 N. Michigan Ave., Chicago 11.

Beam-Knodel Co., 195 Lafayette St., New York 12.

Brown, Arthur S. Mfg. Co., Tilton, N. H.

Formax Mfg. Co., 3000 Bellevue St., Detroit 7.

Iding, M. P., Disc Grinding Compound Co., 3530 W. Pierce St., Milwaukee 4.

(TO BE CONTINUED)

WAA Is Negotiating Sale of Two Former Alumina Factories

Washington

• • • **WAA is negotiating** with the J. R. Simplot Co. and the Columbia Metals Corp. for the sale of two surplus experimental alumina plants which can be converted to production of fertilizer.

Following its policy of giving preference to small business, a high bid of $752,000 for the $4-million Kalunite Inc. plant at Salt Lake City, submitted by American Potash & Chemical Co., was held in abeyance while WAA is attempting to get the Simplot Co. to raise its bid from $635,000 to the American Potash offer.

Both Simplot and a third bidder, Columbia Metals Corp., are recognized by WAA as small businesses. A similar plant at Salem, Ore., is being offered to Columbia which already has the plant under lease.

Founders Elect Officers

Cleveland

• • • **Gray Iron Founders' Society** held a meeting of top gray iron foundry executives in the Pittsburgh area recently, the first of a series of 40 meetings to be conducted throughout the United States for the purpose of organizing local society groups of executives.

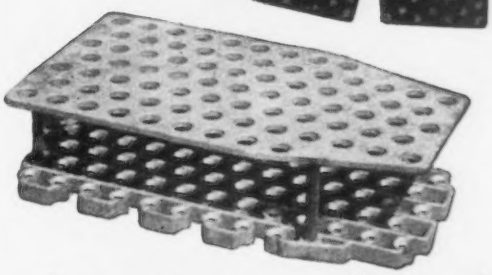
R. G. Schaefer was elected chairman for the ensuing year and W. H. Watts, president, Columbia Radiator Co., was named vice-chairman.

R. L. Collier, executive vice-president, Gray Iron Founders' Society, said, "Many blast furnaces are scheduled to be taken out of blast for much-needed repairs and relining during the coming year" and he suggested a voluntary arrangement among producers to serve foundries during periods when they are unable to obtain pig iron from their regular sources of supply due to furnaces being down for repairs.

•

St. Louis

• • • **A management executives'** group of the Gray Iron Founders' Society was formed in St. Louis,



This assembled tray arrangement of heat-resistant fixtures is used by a prominent automobile manufacturer in a circular furnace having a revolving hearth. Wherever heat treating conditions demand castings of unusual strength and uniformly longer heat-hour service the choice is MICHIANA. Over a quarter century specialized experience goes into the manufacture of every MICHIANA casting. This background of successful production can be used by you to secure sound, practical recommendations for the asking . . .

MICHIANA PRODUCTS CORPORATION,
Michigan City, Indiana.

Your illustrated copy of Bulletin 110 sent upon request.

MICHIANA
Heat-Resistant and Corrosion-Resistant
ALLOY CASTINGS

Dec. 2, with C. B. Shanley, secretary-treasurer, Semi-Steel Castings Co., St. Louis, who presided at the organization meeting, as chairman of the group.

R. L. Collier, executive vice-president, Gray Iron Founders' Society, Cleveland, said, "For every 4 tons of finished steel required by American industry, there is one ton of castings needed. This fact," Mr. Collier continued, "if recognized by steel mills, will lead to more adequate pig iron supplies for foundries."

Canadian Ingot Output Is Increased to 86.7 Pct

Toronto

• • • **Canadian production** of steel ingots and castings rose to 256,461 net tons in October, which was 86.7 pct of total rated capacity, from 234,188 tons in September when the rate was 79.2 pct, and compares with 123,841 tons in October, 1946, when production was down owing to strikes at the major steel plants in Canada. For October this year output included 247,171 tons of steel ingots and 9290 tons of steel castings.

Charges to steel furnaces in October included 131,939 tons of pig iron, 93,014 tons of scrap of consumers' own make and 55,123 tons of purchased scrap.

In the first 10 months of this year cumulative production of steel ingots and castings totaled 2,440,025 net tons, as compared with 1,874,687 tons in the corresponding period last year and with 2,454,061 tons in 1945.

Following are comparative monthly production figures for steel ingots and castings in net tons:

	Steel Ingots	*Steel Castings*
January	243,557	6241
February	233,124	6098
March	263,193	6539
April	244,998	7158
May	235,978	8098
June	230,581	7716
July	226,443	5898
August	226,180	7574
September	225,457	8731
October	247,457	9290
Total 10 Mos.	2,366,682	73,343

New Officers Are Chosen By Southern Scrap Men

• • • **Nathan S. Addlestone,** Addlestone & Co. Inc., Sumter, S. C., was elected president of the Southern chapter of the Institute of Scrap Iron & Steel Inc. at Charlotte, N. C., recently. Mr. Addlestone succeeds W. Alec Rawls of Alec Rawls Wrecking Co. Inc., Rocky Mount, N. C.

Other officers who were elected include: first vice-president, Leo J. Kellheher, Southern Converting Co., Greensboro, N. C.; second vice-president, Morris Brenner, Brenner Iron & Metal Co., Winston-Salem, N. C.; third vice-president, Sol I. Levin, Levin Bros., Burlington, N. C.; secretary-treasurer, Hyman Helbein, Southern Metals Co., Charlotte, N. C.

The executive committee for the coming year will consist of: Mr. Rawls; Seymour Brown, Goldsboro Iron & Metal Co., Goldsboro; Leon Steinberg, Charleston Steel & Metal Co., Charleston; Abe Cohen, Lynchburg Iron & Metal Co., Lynchburg, Va.; Sol Katz, Katz Bros. & Co. Inc., Columbia, S. C.;

Abrasives Assn. Facing Price-Fixing Charges

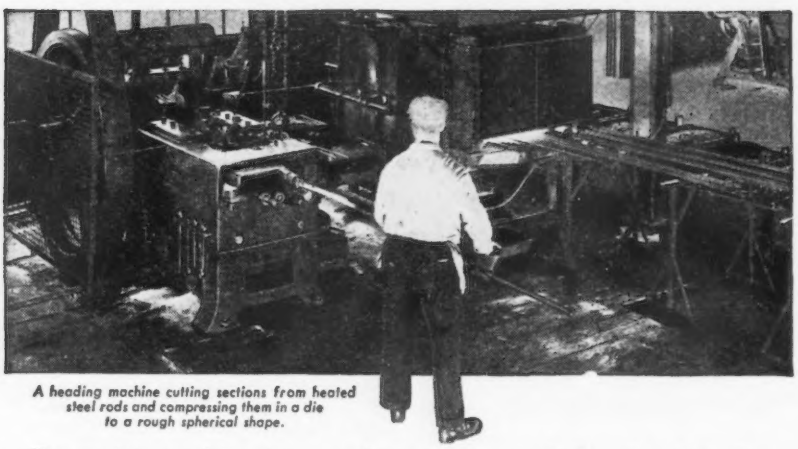
Washington

• • • **Ten members** of the Abrasive Grain Assn. and the association itself have been charged with price-fixing in violation of the Sherman Act. The Dept. of Justice has entered a civil suit in the Buffalo U. S. District Court naming five defendants and five as co-conspirators. They were:

Defendants: Abrasive Grain Assn., Worcester, Mass.; Norton Co., Worcester; Carborundum Co., Niagara Falls; American Abrasive Co., Westfield, Mass.; Exolon Co., Tonawanda, N. Y., and the General Abrasive Co., Inc., Niagara Falls.

Co-conspirators: Washington Mills Abrasive Co., North Grafton, Mass.; Abrasive Products Co., Lansdowne, Pa.; John W. Higman Co., New York City; Wisconsin Abrasive Co., Milwaukee, and Simonds Abrasive Co., Philadelphia.

This is how STROM BALLS are born



A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape.

The steel is carefully chosen and inspected, even before it gets to the heading machine. After being "born" here, balls are carefully "brought up," through a long series of grinding and lapping operations, to the unbelievably high standards of finish, sphericity and precision which have made Strom Metal Balls the standard of Industry. Strom Steel Ball Co., 1850 South 54th Avenue, Cicero 50, Illinois.

Strom BALLS Serve Industry

Largest Independent and Exclusive Metal Ball Manufacturer

Metal Product Tariff Listing Is Continued; Taking Effect Jan. 1

Washington

• • • **The complete listing** of old and new tariff rates negotiated at Geneva to become effective Jan. 1 on metals and metal products is continued on this and the following pages. The listing was begun on page 115 of the Dec. 18 issue of THE IRON AGE, and will be continued in forthcoming issues. The listing follows:

Tariff Act 1930; par. No. — Description—Rate

346 Belt buckles, trouser buckles, and waistcoat buckles, shoe or slipper buckles, and parts thereof, made wholly or partly of iron, steel, or other base metal:

Valued at more than 20 and not more than 50¢ per 100:

Old rate 7¢ per 100 and 10 pct ad valorem; new rate 3½¢ per 100 and 10 pct ad valorem.

Valued at more than 50¢ and not more than $1.66 2/3 per 100:

Old rate 10¢ per 100 and 10 pct ad valorem; new rate 5¢ per 100 and 10 pct ad valorem.

348 Snap fasteners and clasps (except sew-on fasteners,) and parts thereof, by whatever name known, or of whatever material composed, not plated with gold, silver, or platinum; all the foregoing, valued at not more than $1.66 2/3 per 100:

Not mounted on tape:

Old rate 55 pct ad valorem; new rate 27½ pct ad valorem.

Mounted on tape:

Old rate 60 pct ad valorem; new rate 30 pct ad valorem.

349 Metal trouser buttons (except steel) and nickel bar buttons:

Old rate 1/12¢ per line per gross; new rate 1/24¢ per line per gross and 7½ pct ad valorem.

349 Steel trouser buttons:

Old rate ¼¢ per line per gross; new rate 3/20¢ per line per gross and 10 pct ad valorem.

349 Buttons of metal, not specially provided for:

½¢ per line per gross plus 10 pct ad valorem; new rate 3/10¢ per line per gross and 6 pct ad valorem.

349 Metal buttons embossed with a design, device, pattern, or lettering:

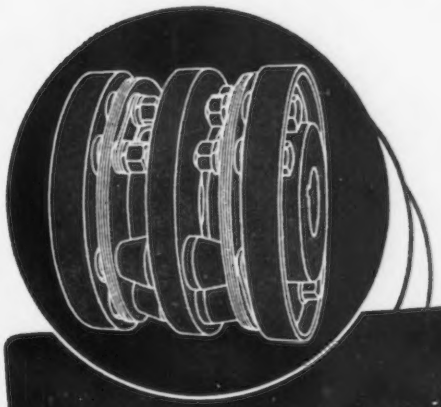
Old rate 45 pct ad valorem; new rate 22½ pct ad valorem.

350 Pins with solid heads, without ornamentation, including hair, safety, hat, bonnet, and shawl pins; and brass, copper, iron, steel, or other base metal pins, with heads of glass, paste, or fusible enamel; all of the foregoing not plated with gold or silver, and not commonly known as jewelry:

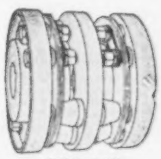
Safety pins:

Old rate 35 pct ad valorem; new rate 22½ pct ad valorem.

THOMAS
Flexible COUPLINGS
are specified by engineers wherever 100% dependability is demanded



THOMAS
Flexible COUPLINGS
provide for
Angular and Parallel Misalignment as well as Free End Float . . .
and Eliminate
BACKLASH, FRICTION, WEAR and CROSS-PULL
NO LUBRICATION IS REQUIRED!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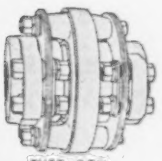
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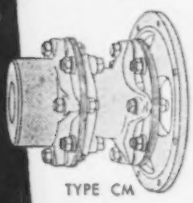
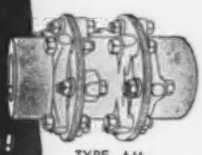
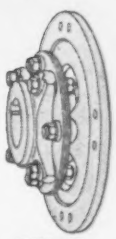
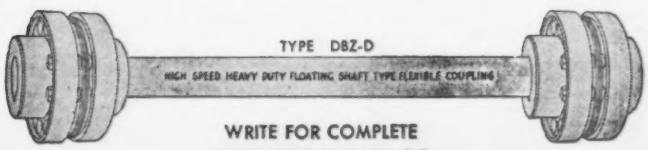

TYPE CM

TYPE ST


TYPE AM

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.


TYPE SS



WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Tariff Act 1930; par. No.	Description—Rate
	Other:
	Old rate 35 pct ad valorem; new rate 20 pct ad valorem.
351	Pens, not specially provided for:
	Of plain or carbon steel:
	Old rate 12¢ gross; new rate 12¢ gross.
	Wholly or in part of other metal:
	Old rate 1¼¢ gross; new rate 1¼¢ gross.
	Any of the foregoing with nib and barrel in one piece:
	Old rate 15¢ gross; new rate 10¢ gross.
352	Cutting tools of any kind containing more than 1/10 of 1 pct vanadium, or more than 2/10 of 1 pct tungsten, molybdenum, or chromium:
	Old rate 60 pct ad valorem; new rate 30 pct ad valorem.
353	Electrical apparatus, instruments (other than laboratory,) and devices, finished or unfinished, wholly or in chief value of metal, and not specially provided for:
	Telegraph (including printing and typewriting,) telephone, and therapeutic (including diagnostic):
	Old rate 17½ or 35 pct ad valorem; new rate 17½ pct ad valorem.
	Signaling, radio, welding, and ignition:
	Old rate 25 pct ad valorem; new rate 15 pct ad valorem.
	X-ray:
	Old rate 17½ pct ad valorem; new rate 10 pct ad valorem.
353	Articles suitable for producing, rectifying, modifying, controlling, or distributing electrical energy, and articles having as an essential feature an electrical element or device, such as electric motors, fans, locomotives, portable tools, furnaces, heaters, ovens, ranges, washing machines, refrigerators, and signs; all the foregoing (not including electrical wiring apparatus, instruments, and devices,) finished, wholly or in chief value of metal, and not specially provided for:
	Switches and switchgear which are not wiring apparatus, instruments, or devices, fans, blowers, and washing machines:
	Old rate 17½ or 35 pct ad valorem; new rate 17½ pct ad valorem.
	Machines for packaging pipe tobacco, machines for wrapping candy, combination candy cutting and wrapping machines, and cooking stoves and ranges:
	Old rate 17½ pct ad valorem; new rate 10 pct ad valorem.
	Internal-combustion engines:
	Carburetor type:
	Old rate 17½ pct ad valorem; new rate 10 pct ad valorem.
	Other, of the horizontal type and weighing not over 5000 lbs each, or not of the horizontal type and weighing not over 2500 lbs each:
	Old rate 17½ pct ad valorem; new rate 10 pct ad valorem.
	Other articles (except machines for determining the strength of materials or articles in tension, compression, torsion, or shear; flashlights, batteries, vacuum cleaners, and internal-combustion engines):
	Old rate 25 pct ad valorem; new rate 15 pct ad valorem.
353	Parts finished or unfinished, wholly or in chief value of metal, not specially provided for, of articles provided for in any item 353 of this Part:
	Old rate same rate duty as articles of which they are parts; new rate same rate duty as articles of which they are parts.
354	Penknives, pocketknives, clasp knives, pruning knives, budding knives, erasers, manicure knives, and all knives by whatever name known, including such as are denominately mentioned in the Tariff Act of 1930, which have folding or other than fixed blades or attachments, all the foregoing (except penknives and pocketknives which have folding blades and steel handles ornamented or decorated with etchings or gilded designs or both,) valued at more than $6 per dozen:
	Provided: That any of the foregoing, if imported in the condition of assembled, but not fully finished, shall be dutiable at:
	Old rate same rate specified for fully finished articles; new rate same rate specified for fully finished articles.
354	Cuticle knives, corn knives, nail files, tweezers, manicure or pedicure nippers, and parts thereof, finished or unfinished, by whatever name known:
	Old rate 60 pct ad valorem; new rate 40 pct ad valorem.
355	Table, butchers', carving, cooks', hunting, kitchen, bread, cake, pie, slicing, cigar, butter, vegetable, fruit, cheese, canning, fish, carpenters' bench, curriers', drawing, furriers', fleshing, hay, sugar-beet, beet-topping, tanners', plumbers', painters', palette, artists', shoe, and similar knives, forks, and steels, and cleavers, all the foregoing, finished or unfinished, not specially provided for:
	With handles of mother-of-pearl, shell, ivory, deer, or other animal horn:
	Old rate 8¢ each and 25 pct ad valorem; new rate 4¢ each and 12½ pct ad valorem.
	With handles plated with and in chief value of silver:
	Old rate 10¢ each and 25 pct ad valorem; new rate 5¢ and 12½ pct ad valorem.
	With handles of silver (other than plated with silver,) or other metal than aluminum, nickel, silver, iron or steel:
	Old rate 16¢ each and 35 pct ad valorem; new rate 16¢ and 35 pct ad valorem.
	With handles of hard rubber, solid bone, celluloid, or any pyroxylin, casein, or similar material:
	Table, carving, cake, pie, butter, fruit, cheese, and fish:
	Old rate 4¢ each and 25 pct ad

JOHNSON Nation-wide STREAMLINE service

HIGH QUALITY *specialty steel wires*

CALL NEAREST OFFICE FOR WAREHOUSE STOCK

Main Office and Plant

53 Wiser Ave. Phone: 6-8301 — WORCESTER, Mass. Teletype No. WO-89

Branch Offices

122 East 42nd St. NEW YORK 17 Phone: MUrray Hill 4-7630 Teletype No. NY 1-2171

1107 Broad St. Station Building PHILADELPHIA 3 Phone: Locust 7-6710 Teletype No. PH 495

560 Hogue Ave. AKRON* Phone: Hemlock 4174

Union Commerce Bldg. CLEVELAND 14 Phone: Main 6560 Teletype No. CV 351

720 Fisher Bldg. DETROIT 2 Phone: Madison 0879 Teletype No. DE 323

1500 Southwestern Ave. CHICAGO Phone: Haymarket 0507

11641 Mona Blvd. LOS ANGELES* Phone: Kimball 2959

Canadian Representative W. Bohne Co. Ltd. 1149 Queen St., West TORONTO 3

*Branch Plant

JOHNSON STEEL AND WIRE COMPANY, INC. WORCESTER 1, MASS.

NEW YORK PHILADELPHIA CLEVELAND DETROIT AKRON CHICAGO LOS ANGELES

Tariff Act 1930; par. No. — Description—Rate

valorem; new rate 2¢ each and 12½ pct ad valorem.

Other:

Old rate 8¢ each and 35 pct ad valorem; new rate 8¢ each and 35 pct ad valorem.

With handles of wood or wood and steel if specially designed for other than household, kitchen, or butchers' use, or with handles of nickel, silver or steel other than austenitic:
If less than 4 in. length, exclusive of handle:

Old rate 2¢ each and 25 pct ad valorem; new rate 2¢ each and 25 pct ad valorem.

If 4 in. length or over, exclusive of handle (except hay forks and 4-tined manure forks):

Old rate 4¢ each and 25 pct ad valorem; new rate 4¢ each and 25 pct ad valorem.

With handles of any other material, including those with handles of wood or wood and steel not specially designed for other than household, kitchen, or butchers' use:
If less than 4 in. length, exclusive of handle:

Old rate 2¢ each and 35 pct ad valorem; new rate 2¢ each and 17½ pct ad valorem.

If 4 in. length or over, exclusive of handle (except hay forks and 4-tined manure forks):

Old rate 8¢ each and 35 pct ad valorem; new rate 8¢ each and 35 pct ad valorem.

Any of the foregoing without handles:
With blades less than 6 in. length:

Old rate 2¢ each and 25 pct ad valorem; new rate 1¢ each and 12½ pct ad valorem.

With blades 6 in. or more length (except hay forks and 4-tined manure forks):

Old rate 4¢ each and 25 pct ad valorem; new rate 2¢ each and 12½ pct ad valorem.

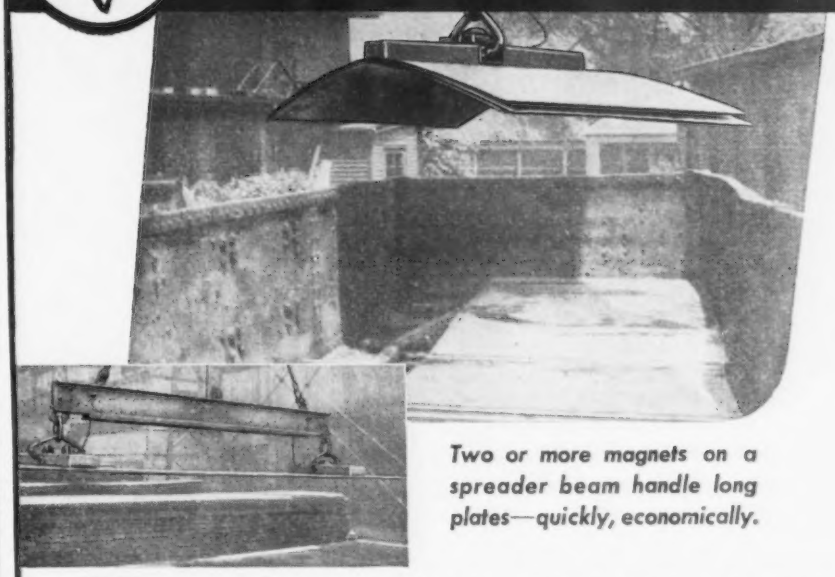
Hay forks and 4-tined manure forks, finished or unfinished, not specially provided for, with handles of any material other than those specifically mentioned in par. 355, Tariff Act of 1930, if 4 in. length or over, exclusive of handle, or without handles, with blades 6 in. or more length.

356 Planing-machine knives, tannery and leather knives, tobacco knives, paper and pulp mill knives, shear blades, circular cloth cutters, circular cork cutters, circular cigarette cutters, and all other cutting knives and blades used in power or hand machines (except knives and blades for meat-cutting, meat-slicing, or meat-chopping machines, and except roll bars, bed plates, and other stock-treating parts for pulp and paper machinery):

Old rate 20 pct ad valorem; new rate 20 pct ad valorem.

E&M

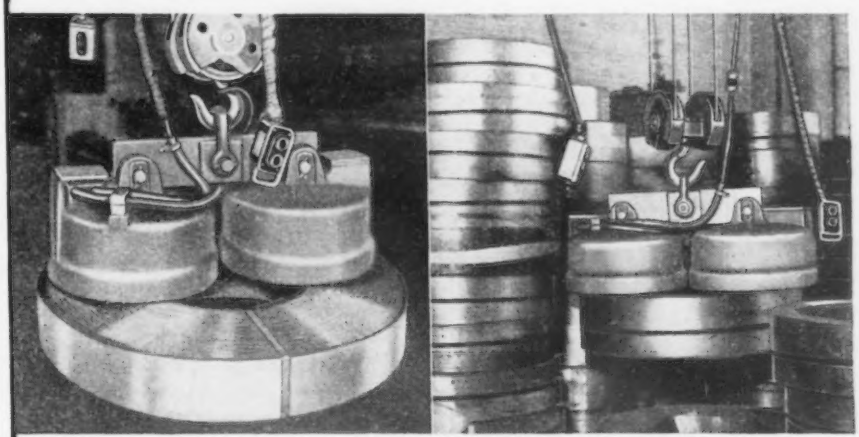
Plate-Handling Magnets
Speed Handling • Cut Costs



Two or more magnets on a spreader beam handle long plates—quickly, economically.

● Unload railroad cars quickly—no prying with crowbar—no chains to slip. (Top view.)

● Take plates from storage for processing. (Upper left.)



Coil-Handling Magnets also Make Savings

● Pile incoming shipments in coil storage. High piling reduces storage area. (Left view.)

● Remove coils from storage for processing—remove single coils without disturbing adjacent piles. (Right view.)

For prompt, complete recommendations on your specific plate or coil handling problem, please advise (1) Style and capacity of crane (2) Voltage available (magnets operate on direct current) (3) Shape, thickness and weight of material to be handled. Bulletins 903 and 904 will accompany the reply and show money-saving methods of operation under similar conditions.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

MACHINE TOOLS

. . . News and Market Activities

Optimism in Industry Tempered by Need for Selling Campaigns

Optimism Centered on First 6 Months; Competition Expected to Grow

° ° °

• • • **With what** will pass for the cream of the postwar machine tool business behind them, key segments of the industry are mobilizing their sales talent for some serious doorbell ringing around the shop circuit in the months ahead.

Despite the fact that December proved to be one of the big months of 1947 for the machine tool industry, the day of some producers waiting for business to come to them is gone for the time being, if not forever.

While most sources in the trade are unwilling to hazard a guess as to what the third quarter will bring, current buying suggests that the first 6 months of the new year should be pretty good. Deliveries on some machines are such that companies ordering obviously feel that they will have need for this equipment some months hence.

Demand for machine tools since the war has been at a constant level, according to the National Machine Tool Builders Assn. The industry produced machines to a total value of $325 million in 1946, and shipped about $300 million worth in 1947. Approximately 20 pct of that production was exported.

Tell Berna, NMTBA general manager, believes that the industry faces a reviving market. The surplus is practically disposed of and the government expects to sell the last surplus machine tool before June 30, 1948

"In the meantime, there is a shortage of labor in the United States and a tremendous demand for manufactured products. The machine tool builder feels that he has the answer to the nation's greatest need at this moment.

In Detroit, most segments of the machine tool industry are optimistic about the prospects for 1948. In many lines December volume was on a par with November and there are strong indications that January volume will at least hold at present levels.

While General Motors is inactive in the machine tool market at the moment, Ford is making limited purchases for the Mound Road plant. Inquiries have also gone out for a huge new tooling program for Dodge estimated to cost $40 million. Kaiser-Frazer has also requested quotations on a substantial amount of new equipment, it is reported.

Detroit tool and die shops are busier than at any time since the war and patterns are said to be piling up in foundries producing auto dies. With auto production at full throttle in December, unemployment in Detroit is estimated at 5 pct of the total labor force, a record peacetime low.

The industry coasted into the holiday season with little change in activity being reported by the various segments of the industry. Some price increases have been made recently and there is some active consideration being given to the advisability of going back to escalator clauses in new contracts.

On the brighter side, it is now indicated that Ford will buy new tooling for the new Mound Road div.; it had previously been expected that Ford would lease from WAA a substantial amount of equipment already in the plant.

One of the last of the new tool and die contracts appeared recently in the Detroit tool and die shops when Chrysler placed orders for all four lines of cars. According to informed sources, the volume of new tooling is modest compared to some past standards. However, the amount of new work does compare favorably with other contracts recently placed in Detroit. Delivery date for the new dies has been set for the spring of 1948, it is reported.

In Washington, an electrically operated copy milling machine and an automatic bar machine are described in two reports now on sale by the Office of Technical Services, Dept. of Commerce.

The reports, prepared by several OTS investigators, are based on visits to the two German firms manufacturing these machines.

The milling machine is designed to asist in the economic manufacture of dies and molds of all kinds, even with tough materials, according to a translation of the instructions for use. The machine has three-directional table control motors which can reach their full speed of 1400 rpm in 0.008 sec and reverse their rotation twice per second.

The automatic bar chucking machine is considered to be very flexible, and according to the investigators, "in small job shops where changes in tool setups are very frequent, a machine of this type has excellent possibilities."

The machine is equipped with 4-spindles and has six independently operated cross slides of the gunning type. Each spindle is provided with an individual longitudinal toll slide. The six cross slides and the four longitudinal slides are operated by individual cams through feed mechanisms which provide substantial variation in feeds without changing cams.

Copies of the report (PB-1284) on the electrically operated copy milling machine sell for 75¢. Copies of the report (PB-1338) on the automatic bar machine sell for 25¢.

First sample shipment of a new precision machinist's calipers imported from Sweden has been received by Victor Peterzell, manufacturer's representative, Philadelphia.

These are 6-in. instruments and are designed with special knife tips for holes, beveled jaws for thread measurement, depth gage and thread table. Measuring carriage is provided with automatic brake which is released with finger pressure.

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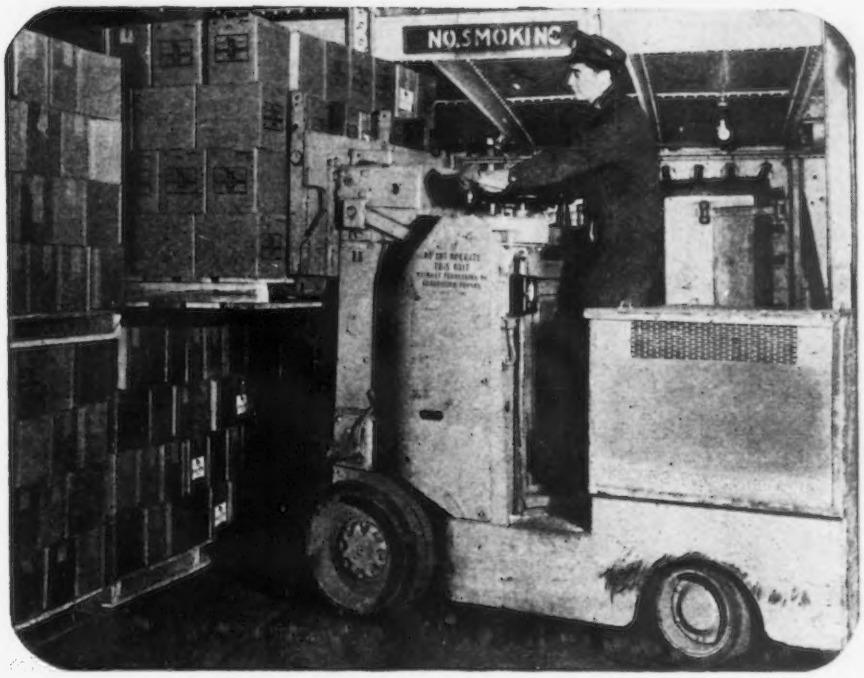

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They are **simple and easy to maintain.**

NONFERROUS METALS

. . . News and Market Activities

Little Progress Made By Minerals Committee

New York

• • • **The prospects** of an integrated and effective program for maximum development of domestic minerals resources growing out of the Krug Minerals Advisory Committee are not promising at this time, according to information obtained from industry members who participated in the first meeting. Results of the meeting were not constructive, largely because of the conflicting interests of the industry members participating and the fact that neither members nor Interior Dept. officials had anything tangible to offer as the basis for developing a program. Subcommittees were formed for individual metals and others to study overall problems. In the opinion of some members the likelihood of subsequent meetings of some committees is in doubt.

One of the principal means calculated to foster minerals development is the working out of a subsidy program to encourage development and marginal production acceptable to the industry and the government. The industry is still divided over this question and low cost producers are definitely opposed to most plans for subsidized production despite the recent declaration of policy made by the American Mining Congress which seemed to indicate a policy favoring incentives. High cost producers have discussed a variety of proposals for subsidizing marginal production, but according to informed observers, details required for implementing such programs are generally nebulous and when looked at critically have important objections.

It appears at this time that if a constructive program for new minerals exploration, development and marginal mines production is to be worked out, a greater degree of leadership must be assumed by government in subsequent meetings of the Committee.

•

U.S. Sells More Lead Scrap

Washington

• • • **Twenty more** lots of Japanese lead scrap, totalling 714 tons, have been sold by the Reconstruction Finance Corp. to five U. S. bidders, RFC announced last week through U. S. Commercial Co.

The successful bidders are American Metals Co., Ltd., New York; Hudson Smelting & Refining Co., Newark, N. J.; National Lead Co., New York; North American Smelting Co., Philadelphia; and Emil A. Schroth, Newark, N. J.

Average price paid for the first eight lots was 15.50¢ per lb, while the average price for lots 9 through 20 was 17.031¢ per lb, RFC said.

•

Metals Costs Increase

New York

• • • **The increase** of freight rates on interstate shipments which went into effect on Monday had little immediate effect on nonferrous metals at major consuming points except that the price of zinc at New York now carries the full 20 pct freight increase, bringing it to 11.10¢. However, the increase of 20¢ a ton on ores and concentrates of zinc, lead, copper and aluminum is expected to exercise pressure on producers which might well lead to price increases in the near future.

The effects of higher freight costs may make themselves felt first in zinc and lead whose producers have already complained of high production costs. At least one aluminum producer has also stated for publication that higher prices might be made necessary by rising costs. Copper producers may be expected to absorb the higher freight costs on ores and concentrates, and perhaps on refined metal to the Valley, as they did on the last ICC-granted freight rise. However, some readjustment of refinery differentials has already been forecast.

•

Monthly Average Prices

• • • **The average prices of the major nonferrous metals in December based on quotations appearing in** THE IRON AGE, **were as follows:**

	Cents Per Pound
Electrolytic copper, Conn. Valley	21.50
Lake copper, Conn. Valley	21.625
Straits tin, New York	85.385
Zinc, East St. Louis	10.50
Zinc, New York	11.06
Lead, St. Louis	14.80
Lead, New York	15.00

Nickel

• • • **The new spot** price for electrolytic nickel F.O.B. New York is set tentatively at 36.56¢ per lb, based on the 1¼¢ tariff reduction and an estimate of the freight rate increase. According to company officials, the prices of mill products will not be reduced as a result of the tariff reduction on nickel.

•

Set Bolivian Tin Price

Washington

• • • **An agreement** has been reached with Bolivian tin producers for the purchase by the Reconstruction Finance Corp. during 1948 and 1949 of Bolivian tin ores and concentrates.

The base price will be 90¢ per lb of payable tin in concentrates, f.o.b. South American ports, varying directly with deviations in the value of Grade A tin at New York.

Nonferrous Metals Prices

Cents per pound

	Dec. 31	Jan. 2	Jan. 3	Jan. 5	Jan. 6
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	94.00	94.00	94.00	94.00	94.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be.	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be.	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$80 to $90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$80 to $82
Nickel, electro, f.o.b. New York	36.56¢
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$66 to $69
Silver, New York, cents per oz.	74.625
Tin, Grade A, New York	94.00
Zinc, East St. Louis	10.50
Zinc, New York	11.10
Zirconium copper, 6 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	18.50-19.00
No. 120	18.00-18.50
No. 123	17.50-18.00
80-10-10 ingot	
No. 305	23.50-24.00
No. 315	21.00-21.50
88-10-2 ingot	
No. 210	30.00-30.50
No. 215	28.00-28.50
No. 245	22.75-23.25
Yellow ingot	
No. 405	14.50-15.50
Maganese Bronze	
No. 421	18.00-18.50

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 capper, max.	16.00-16.75
0.60 copper, max.	15.50-16.25
Piston alloys (No. 122 type)	15.50-16.00
No. 12 alum. (No. 2 grade)	15.25-15.75
108 alloy	15.50-16.00
195 alloy	15.50-16.50
AXS-679	15.75-16.25
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-95½ pct	15.25-16.00
Grade 2—92 pct-95 pct	14.00-15.00
Grade 3—90 pct-92 pct	13.50-14.50
Grade 4—85 pct-90 pct	13.25-14.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, cast, 99.99	18¾
Nickel, 99 pct plus, frt allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	44.50
Copper sulfate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	16.00
Zinc cyanide, 100 lb drums	35.50
Zinc sulfate, 89 pct, granules, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall; 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75-S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness; 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam. rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢ 10,000 lb base. B & S gage 00-1; 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, $1.25-$1.31; 24, $1.71-$1.75.

Round Rod: M, diam, in., ¼ to ⅜, 47¢; ½ to ¾, 45¢ 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.21; 5/16 to ⅜, $1.12; ⅜ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	..	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks	..	81

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

Cents per pound, freight prepaid on 200 lb.

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.93	....
Copper, drawn	....	31.03	....
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.90
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural bronze	27.94	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Yellow brass rod turnings	14¼¢
Leaded yellow brass turnings	14¼¢
Loose yellow brass trimmings	15¼¢

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	16½—17
No. 2 heavy copper and wire	15½—16
Light copper	14 —14½
Auto radiators (unsweated)	9¼— 9¾
No. 1 composition	12 —12½
No. 1 composition turnings	11½—12
Clean red car boxes	10 —10½
Cocks and faucets	9¾—10¼
Mixed heavy yellow brass	7½— 8
Old rolled brass	8 — 8½
Brass pipe	8¾— 9¼
New soft brass clippings	11½—12
Brass rod ends	9 — 9½
No. 1 brass rod turnings	9 — 9½

Aluminum

Alum. pistons with struts	4½— 5
Aluminum crankcases	6 — 6½
2S aluminum clippings	9 — 9½
Old sheet & Utensils	6 — 6½
Mixed borings and turnings	— 2
Misc. cast aluminum	5½— 6
Dural clips (24S)	5 — 5½

Zinc

New zinc clippings	6 — 6½
Old zinc	4½— 5
Zinc routings	2½— 3
Old die cast scrap	2½— 3

Nickel and Monel

Pure nickel clippings	15½—17½
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	8 — 8½
Nickel silver clippings, mixed	7½— 8
Nickel silver turnings, mixed	5½— 6

Lead

Soft scrap lead	11¼—11¾
Battery plates (dry)	6½— 7

Magnesium Alloys

Segregated solids	6½— 7
Castings	4½— 5¼

Miscellaneous

Block tin	73 —75
No. 1 pewter	53 —55
No. 1 auto babbitt	43 —45
Mixed common babbitt	11½—12
Solder joints	16½—17
Siphon tops	43 —45
Small foundry type	13 —13½
Monotype	12 —12½
Lino and stereotype	11½—12
Electrotype	10 —10½
New type shell cuttings	11 —11½
Clean hand picked type shells	4½— 5
Lino and stereo dross	5 — 5½
Electro dross	3¼— 3½

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
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Lead traps and bends, List	+42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules, List	+42%
Lead wool	19.50

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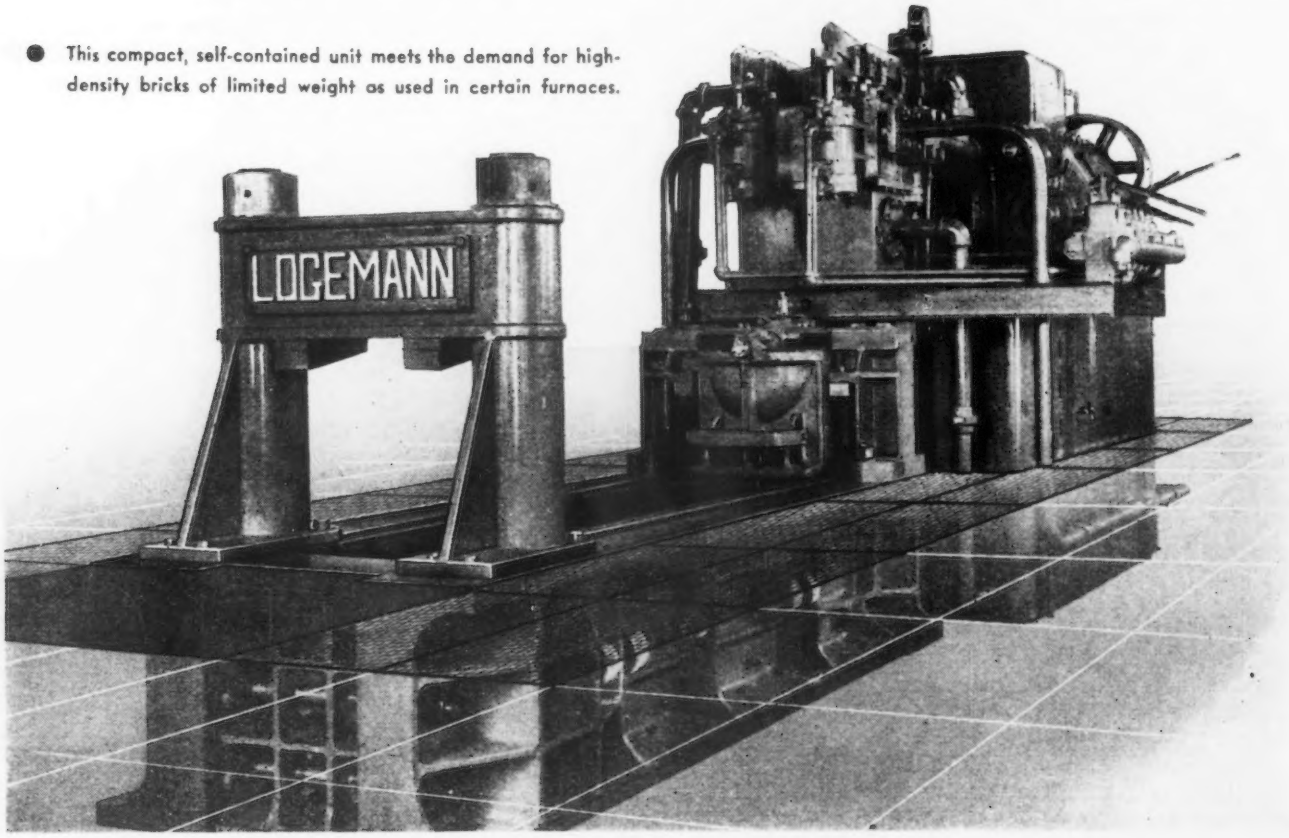

SCRAP

. . . News and Market Activities

Broker Buying Strengthens Market

New York

• • • **In the absence** of confirmed information on scrap purchases by large consumers the market must be appraised this week on the basis of purchases by small mills and broker activity. Broker buying in most centers is at levels above those offered publicly by the large mills. Buying by small consumers is also going at $1.00 to $4.00 above the "formula" price levels.

It is no longer possible for the brokers to indicate that they are covering on old orders. The time has run out on this stock reply. New strength in the markets in St. Louis, New York, and Boston indicates that purchases are being made by some interests for delivery into the major scrap consuming centers at substantially higher levels than the formula.

There was a marked tendency on the part of brokers to buy scrap conservatively, avoiding speculative purchases. Some were still reported to be doing a business from time to time on the basis of formula prices in the interests of maintaining customer relationships, at the expense of the profit sheet.

There have been signs in some areas of frantic behind the scenes activity as scrap stocks waste away, and the possibility of making further expansions of pig iron use vanishes. The efforts to curb the upward movement of the scrap market are being continued—if there is a general swing upward brought about by broadcast purchases by mills—the pressure to prevent a continuous increase will still be there.

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PITTSBURGH—Another week of inactivity has given the trade worse jitters. By early this week no mill had made a substantial purchase. While stockpiles in this district aren't as poor as they are reported to be elsewhere there are signs that a representative tonnage may have to be bought soon. Brokers wouldn't take any big orders at $41 early in the week. They say they want more than that for fear they won't be able to cover. Some smaller dealers are shipping a little at $40 delivered but most are holding off. Mills still hold to the $40 formula but some smaller consumers have broken it on small sales. These amount to 250 tons or so, not a representative tonnage. Purchase by a steel company of a major coke supply source was expected to weaken the cast iron market but the latest sale was at $55.50, up 50 cents from the previous week. Full effect of the need for many local foundries to find a new coke source won't be felt for a few more weeks. Short shoveling turnings and cast iron borings prices rose, breaking away from the pattern.

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CHICAGO—On the surface the market appears quiet but behind the scenes there appears to be frantic activity. From what has gone on to date observers say the old formula prices have already fallen apart and the reason the mills haven't issued new prices is that they can't decide what the new floor price should be. Authoritative sources say that whatever the new formula prices might be they will still constitute a floor and not a ceiling price.

•

PHILADELPHIA—The market here has a very strong undertone and brokers' buying prices are reported to be higher than last week for heavy melting and turnings. Mill purchases of heavy melting have not been made at a higher price than quoted last week, but mills would be willing to take much larger tonnages than they can get at that price. Brokers are eager to go long on scrap, expecting an early price rise, but dealers are not in a selling mood. Frankfort arsenal turnings sold at $32.87 f.o.b., indicating a price of $35 delivered. However, the price spread has been narrowed to a range of $34 to $34.50.

•

DETROIT—The most unsettled conditions in many months prevailed here in the scrap market this week as buyers and sellers sparred to see who would weaken first. Large mill buyers are insisting on the price formula but admitted that shipments have fallen off sharply during the past fortnight and no new orders are being taken. Reports of transactions at over-the-formula prices have thus far been limited to hardship cases and small buyers. In the meantime cast iron prices continued skyward but the first reports were coming in that prospective buyers were backing away from the $65 to $70 asking price.

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CLEVELAND—Despite the absence of any market activity here or in the Valley, except in the foundry grades, the trade is full of rumors. Most major consumers seem determined to wait each other out and force the other fellow to break the formula first. Brokers are very quiet, doing little buying, and certainly none on a speculative basis. Dealers' yards are accumulating some material, but only earmarked scrap is moving to the mills.

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ST. LOUIS—Although steel mills in the St. Louis industrial district are paying only $40.50 to $41 for No. 1 heavy melting, dealers have been paying $42 to $43 because they say they cannot get it for less, and are shipping their purchases to other markets. No. 2 heavy melting is unchanged, but foundry grades prices continue to rise.

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BUFFALO — Leading consumers of openhearth grades were holding to their $39.25 formula early this week but getting little or no open market scrap at that price. Smaller steel makers, however, were reported paying $41 to $42 a ton and some shipments to mills outside the district were being made at approximately the same figure. Canadian brokers were scouring the market for No. 2 steel at about a dollar over the formula, but no idea could be obtained as to how much they bought. With receipts comparatively light, dealers were preparing a larger percentage of their scrap for foundry use, getting $6 to $8 over the openhearth price for it. Cast grades were scarce and nominally unchanged.

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NEW YORK—The trade here is beginning to get back into business following the complete paralysis brought about by the snow storm. There is general agreement that with the reduced supplies of scrap available, there is sufficient buying by small consumers to support a market at levels above the formula figure, regardless of the absence of buying by large mills. The cast scrap market is continuing its strong upward movement, hitting $50 for the first time this week.

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BOSTON—Brokers have made up their minds scrap is not available at prices heretofore offered, and freely predict they will raise the ante by the end of another week. Whether they get scrap is problematical. For any grade of cast $50 to $52 in carlots and as high as $55 delivered by truck to nearby consuming points is offered, but there have been no sales because yard scrap piles are buried in snow and ice.

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BIRMINGHAM — Increased shipments here of openhearth grades at $37 may reflect the year-end inventory. Whatever the causes the tonnages moving into consumption at that mill-offered price have increased substantially. Some scrap is being held in anticipation of higher prices, however, as bad weather in the North increases efforts of northern mills to obtain material from southern sources. Prices were generally unchanged at the beginning of the week.

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SEATTLE—While a few deals are still being closed at $24, most metal is now going for $26. Puget Sound Naval Yards contracts for the next three months were placed at $24.50 for unprepared and $25.08 for prepared. Scrap is becoming more plentiful due to the increasing number of LSTs the Navy is bringing in from the Pacific.

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TORONTO—Movement of scrap to dealers and consumers was brought to a standstill for the first five or six days of the New Year as a result of a heavy snowfall that blanketed Toronto and most sections of Ontario.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00
RR. hvy. melting	$40.50 to 41.00
No. 2 hvy. melting	40.00
RR. scrap rails	50.00 to 51.00
Rails 2 ft. and under	54.00 to 55.00
No. 1 comp'd bundles	40.00
Hand bdld. new shts.	40.00
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.00 to 35.50
Shoveling turn.	37.00 to 37.50
Mixed bor. and turn.	37.00 to 37.50
Cast iron borings	37.00 to 37.50
No. 1 cupola cast.	54.50 to 55.50
Hvy. breakable cast.	41.50 to 42.50
Malleable	60.00 to 61.00
RR. knuck. and coup.	52.50 to 53.50
RR. coil springs	52.50 to 53.50
RR. leaf springs	52.50 to 53.50
Rolled steel wheels	52.50 to 53.50
Low phos.	47.00 to 48.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 dealers' bundles	39.00 to 40.00
Bundled mach. shop turn.	39.00 to 40.00
Galv. bundles	37.00 to 38.00
Mach. shop turn.	34.00 to 35.00
Short shov. turn.	36.00 to 37.00
Cast iron borings	35.00 to 36.00
Mix. borings & turn.	34.00 to 35.00
Low phos. hvy. forge	47.00 to 48.00
Low phos. plates	44.00 to 45.00
No. 1 R.R. hvy. melt.	46.00 to 47.00
Rerolling rails	60.00 to 61.00
Miscellaneous rails	54.00 to 55.00
Angles & splice bars	55.00 to 56.00
Locomotive tires, cut	55.00 to 56.00
Cut bolster & side frames	54.00 to 54.50
Standard stl. car axles	60.00 to 61.00
No. 3 steel wheels	51.50 to 52.00
Couplers & Knuckles	52.00 to 52.50
Rails 2 ft. and under	60.00 to 62.00
Malleable	71.00 to 73.00
No. 1 mach. cast.	62.00 to 65.00
No. 1 agricul. cast.	60.00 to 61.00
Hvy. breakable cast.	45.00 to 48.00
RR. grate bars	52.00 to 53.00
Cast iron brake shoes	52.00 to 53.00
Cast iron carwheels	49.00 to 50.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.00 to $40.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 bundles	38.00 to 40.00
No. 2 bundles	38.00 to 40.00
Mach. shop turn.	33.00 to 34.00
Shoveling turn.	33.00 to 34.00
Cast iron borings	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Low phos. plate	49.00 to 50.00
No. 1 cupola cast.	53.00 to 55.00
Hvy. breakable cast.	42.00 to 43.00
Scrap rails	49.00 to 50.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	$33.00 to $35.00
No. 2 hvy. melting	31.40 to 32.00
Nos. 1 and 2 bundles	31.40 to 32.00
Busheling	31.40 to 32.00
Shoveling turn.	32.00 to 32.50
Machine shop turn.	28.50 to 29.50
Mixed bor. & turn.	28.50 to 29.50
Cl'n cast. chem. bor.	33.00
No. 1 machinery cast.	44.00 to 45.00
No. 2 machinery cast.	44.00 to 45.00
Heavy breakable cast.	40.00 to 41.00
Stove plate	39.00 to 40.00

DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	$34.75 to $35.25
No. 2 hvy. melting	34.75 to 35.25
No. 1 bundles	34.75 to 35.25
New busheling	34.75 to 35.25
Flashings	34.75 to 35.25
Mach. shop turn.	28.50 to 29.00
Shoveling turn.	29.50 to 30.00
Cast iron borings	29.50 to 30.00
Mixed bor. & turn.	29.50 to 30.00
Low phos. plate	39.75 to 40.25
No. 1 cupola cast.	60.00 to 65.00
Heavy breakable cast.	48.00 to 51.00
Stove plate	48.00 to 51.00
Automotive cast.	60.00 to 65.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn.	34.00 to 34.50
Shoveling turn.	35.00 to 36.00
Mixed bor. & turn.	34.00 to 34.50
Clean cast chemical bor.	40.00 to 42.00
No. 1 machinery cast.	55.00 to 56.00
No. 1 mixed yard cast.	50.00 to 54.00
Hvy. breakable cast.	50.00 to 52.00
Clean auto cast.	55.00 to 56.00
Hvy. axle forge turn.	42.50 to 43.50
Low phos. plate	47.00 to 47.50
Low phos. punchings	47.00 to 47.50
Low phos. bundles	46.50 to 47.00
RR. steel wheels	50.00 to 51.00
RR. coil springs	50.00 to 51.00
RR. malleable	65.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.50 to $41.00
No. 2 hvy. melting	38.00 to 39.00
Bundled sheets	38.00 to 39.00
Mach. shop turn.	32.00 to 33.00
Locomotive tires, uncut.	47.00 to 48.00
Mis. std. sec. rails	53.00 to 54.00
Rerolling rails	55.00 to 56.00
Steel angle bars	54.00 to 55.00
Rails 3 ft. and under	58.00 to 60.00
RR. steel Springs	49.00 to 50.00
Steel car axles	52.00 to 53.00
Grate bars	51.00 to 52.00
Brake shoes	53.00 to 54.00
Malleable	68.00 to 69.00
Cast iron car wheels	55.00 to 56.00
No. 1 machinery cast.	68.00 to 69.00
Hvy. breakable cast.	53.00 to 54.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	37.00 to 38.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	37.00 to 38.00
Long turnings	23.00 to 24.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cupola cast.	55.00 to 57.50
Stove plate	48.00 to 50.00
No. 1 RR. hvy. melt.	36.00 to 37.00
Steel axles	38.00 to 39.00
Scrap rails	37.50 to 38.00
Rerolling rails	52.00 to 54.00
Angles & splice bars	40.00 to 41.00
Rails 3 ft. & under	40.00 to 41.00
Cast iron carwheels	47.00 to 48.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Short shov. turn.	36.50 to 37.00
Cast iron borings	35.50 to 36.00
Low phos	47.00 to 47.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	36.00 to 37.00
No. 2 bundles	36.00 to 37.00
Comp. galv. bundles	32.00 to 33.00
Mach. shop turn.	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Shoveling turn.	30.00 to 31.00
No. 1 cupola cast.	50.00
Hvy. breakable cast.	50.00
Charging box cast.	50.00
Stove plate	50.00
Clean auto cast.	50.00
Unstrip. motor blks.	46.50 to 47.00
Cl'n chem. cast bor.	33.50 to 34.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	41.00 to 42.00
No. 1 busheling	41.00 to 42.00
Mach. shop turn.	32.50 to 33.50
Shoveling turn.	34.50 to 35.50
Cast iron borings	31.50 to 32.50
Mixed bor. & turn.	31.50 to 32.50
Mixed cupola cast.	53.00 to 55.00
Charging box cast.	48.00 to 50.00
Stove plate	52.00 to 54.00
Clean auto cast.	58.00 to 60.00
RR. Malleable	70.00 to 72.00
Small indl. malleable	47.00 to 49.00
Low phos. plate	46.00 to 49.00
Scrap rails	49.00 to 50.00
Rails 3 ft. & under	52.00 to 54.00
RR. steel wheels	48.00 to 50.00
Cast iron carwheels	48.00 to 50.00
RR. coil & leaf spgs.	48.00 to 50.00
RR. knuckles & coup.	48.00 to 50.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 1 busheling	39.00 to 39.50
Drop forge flashings	39.00 to 39.50
Mach. shop turn.	34.00 to 34.50
Shoveling turn.	36.00 to 36.50
Steel axle turn.	39.00 to 39.50
Cast iron borings	35.00 to 35.50
Mixed bor. & turn.	34.00 to 34.50
Low phos.	44.00 to 44.50
No. 1 machinery cast.	56.00 to 60.00
Malleable	68.00 to 70.00
RR. cast.	58.00 to 60.00
Railroad grate bars	50.00 to 52.00
Stove plate	52.00 to 54.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft. & under	58.00 to 60.00
Rails 18 in. & under	59.00 to 61.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	$25.00
No. 2 hvy. melting	25.00
No. 2 bales	25.00

Per gross ton delivered to consumer:

No. 3 bales	$19.50
Mach. shop turn.	16.00
Elec. furn. 1 ft. und	$32.00 to 34.00
No. 1 cupola cast.	32.00 to 33.00
RR. hvy. melting	26.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$25.50
No. 2 hvy. melting	25.50
No. 1 bales	25.50
No. 2 bales	25.50
No. 3 bales	19.50
Mach. shop turn.	17.50
No. 1 cupola cast.	$36.00 to 40.00
RR. hvy. melting	26.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$25.50 to $26.50
Elec. furn. 1 ft. and und.	27.50 to 30.00
No. 1 cupola cast.	27.50
RR. hvy. melting	25.00 to 26.00

HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact., prep'd	21.00*
Bushelings, new fact., unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	36.00 to 40.00

*Ceiling Price.

Comparison of Prices . .

Advances over past week in Heavy Type, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-rolled Steel: (cents per pound)	Jan. 6, 1948	Dec. 30, 1947	Dec. 9, 1947	Jan. 7, 1947
Hot-rolled sheets	2.80	2.80	2.80	2.50
Cold-rolled sheets	3.55	3.55	3.55	3.20
Galvanized sheets (10 ga.)	3.95	3.95	3.95	3.55
Hot-rolled strip	2.80	2.80	2.80	2.50
Cold-rolled strip	3.55	3.55	3.55	3.20
Plates	2.95	2.95	2.95	2.50
Plates wrought iron	6.85	6.85	6.85	5.95
Stain's c-r strip (No. 302) *24 gage	30.50	30.50	30.50	30.30
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.80	$5.75	$5.75	$5.00
Tinplate, electro (0.50 lb)	6.00	5.05	5.05	4.50
Special coated mfg. ternes	5.90	4.90	4.90	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.60
Cold-finished bars	3.55	3.55	3.55	3.20
Alloy bars	3.30	3.30	3.30	3.05
Structural shapes	2.80	2.80	2.80	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	25.97
Wrought iron bars	7.15	7.15	7.15	6.15
Wire and Wire Products: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.30
Wire nails	4.25	4.25	4.25	3.75
Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$2.50
Light rails	3.10	3.10	3.10	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00	$45.00	$45.00	$39.00
Sheet bars	66.00	66.00	66.00	38.00
Slabs, rerolling	45.00	45.00	45.00	39.00
Forging Billets	55.00	55.00	55.00	47.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.55
Skelp	2.60	2.60	2.60	2.05

Pig Iron: (per gross ton)	Jan. 6, 1948	Dec. 30, 1947	Dec. 9, 1947	Jan. 7, 1947
No. 2, foundry, Phila.	$43.10	$42.98	$40.97	$32.43
No. 2, Valley furnace	39.00	37.50*	36.50	30.50
No. 2, Southern Cin'ti	43.28	39.74*	40.24	29.80
No. 2, Birmingham	37.38	34.38*	34.38*	26.88
No. 2, foundry, Chicago†	38.00	38.00*	36.00	30.50
Basic del'd Philadelphia	42.60	42.48	40.47	31.93
Basic, Valley furnace	38.50	37.00*	36.00	30.00
Malleable, Chicago†	38.50	38.50*	36.50	30.50
Malleable, Valley	39.50	37.50*	36.50	30.50
Charcoal, Chicago	57.48	56.04	56.04	42.99
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
* Revised.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$40.00	$40.00	$40.00	$32.25
Heavy melt'g steel, Phila.	40.50	40.50	42.00	31.00
Heavy melt'g steel, Ch'go	39.50	39.50	38.75	29.75
No. 1, hy. comp. sheet, Det.	35.00	35.00	34.75	27.00
Low phos. Young'n	47.25	47.25	47.25	34.25
No. 1, cast, Pittsburgh	55.00	54.50	53.50	40.38
No. 1, cast, Philadelphia	55.50	55.50	53.50	41.50
No. 1, cast, Chicago	63.50	63.50	58.50	42.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.50	$12.50	$8.75
Foundry coke, prompt	14.00	14.00	14.00	8.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	19.50
Copper, Lake, Conn.	21.625	21.625	21.625	19.625
Tin, Grade A, New York	94.00	94.00	80.00	70.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	12.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.25

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Jan. 6, 1948	3.18925¢ per lb.	$39.00 per gross ton	$40.00 per gross ton
One week ago	3.18925¢ per lb.	$37.98 per gross ton	$40.00 per gross ton
One month ago	3.18925¢ per lb.	$37.06 per gross ton	$40.25 per gross ton
One year ago	2.83599¢ per lb.	$30.14 per gross ton	$31.17 per gross ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1948	3.18925¢ Jan. 6		$39.00 Jan. 6		$40.00 Jan. 6	
1947	3.18925¢ Aug. 12	2.87118¢ Jan. 7	$37.98 Dec. 30	$30.14 Jan. 7	$42.58 Oct. 28	$29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1941	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1940	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1939	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1938	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1937	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1936	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1935	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1934	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1933	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1932	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1931	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1930	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1929	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: includes 3 pct freight tax. (14) Kaiser Co. prices (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (17) Delivered Los Angeles: add ½¢ per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases. Some producers charge (19) $2 more, (21) $1 more. Some producers charge (22) 0.05¢ less, (23) 0.10¢ less, (24) 0.20¢ less.

Basing Points	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio		San Franc'co, Los Angeles, Seattle	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS															
Carbon, rerolling	($38.00 f. o. b. mill) (Spot market as high as $86 to $90 gross ton)														
Carbon, forging	$48.00														
Alloy	$58.00									(Canton = $58.00)					
BILLETS, BLOOMS, SLABS															
Carbon, rerolling [18]	$45.00[19]	$45.00[19]	$45.00[19]	$47.00	$45.00[19]	$45.00[19]							$48.00[19]		
Carbon, forging billets	$55.00	$55.00	$55.00	$55.00	$55.00	$55.00							$58.00		
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)						$69.00		
SHEET BARS							Subject to negotiation								
PIPE SKELP	2.60¢[21]						2.60¢[21]								
WIRE RODS	2.80¢[21]	2.80¢[21]		2.80¢[21]	2.85¢		(Worcester = 2.90¢[21])					3.52¢[13]			
SHEETS															
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢		(Ashland, Ky. = 2.80¢)		3.54[17]¢	2.95¢	3.148¢	3.040¢
Cold-rolled [1]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.70¢	4.00¢	4.016¢
Galvanized (10 gage)	3.95¢[23]	3.95¢[23]	3.95¢[23]		3.95¢[23]		3.95¢	3.95¢	4.05¢	3.95¢	(Ashland = 3.95¢)	4.62¢[17]		4.298¢	4.190¢
Enameling (12 gage)	3.95¢[22]	3.95¢[22]	3.95¢[22]	3.95¢			3.95¢		4.05¢	3.95¢			4.10¢[22]	4.468¢	4.408¢
Long ternes [2] (10 gage)	4.05¢[24]		3.85¢											4.566¢	4.506¢
STRIP															
Hot-rolled [3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60[17]¢	2.95¢	3.316¢	3.256¢
Cold-rolled [4]	3.55¢	3.65¢	3.65¢	3.55¢			3.55¢			(Worcester = 3.75¢)			3.70¢	4.066¢	4.006¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.616¢	
TINPLATE															
Cokes, 1.50 lb [1], base box	$6.80	$6.80	$6.80		$6.90			$6.90	$6.90	(Warren, Ohio = $6.80)				$7.248	$7.140
Electro, box 0.25 lb	Deduct $1.00 from 1.50 lb coke base box price														
Electro, box 0.50 lb	Deduct 80 ¢ from 1.50 lb coke base box price.														
Electro, box 0.75 lb	Deduct 60 ¢ from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING															
55 lb to 70 lb	Deduct $1.60 from 1.50 lb coke base box.														
75 lb to 3 5 lb	Deduct $1.70 from 1.50 lb coke base box.														
100 lb to 128 lb	Deduct $1.60 from 1.50 lb coke base box.														
BLACKPLATE, h. p. 29 ga [11]	4.75¢	4.75¢	4.75¢		4.85¢			4.85¢	4.85¢					5.198¢	5.090¢
BARS															
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625[17]¢	3.05¢	3.35¢	3.358¢
Rail steel [6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet) [7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325[17]¢		3.098¢	2.990¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished [5]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.70¢	4.00¢	4.006¢
Alloy, hot-rolled	3.30¢	3.30¢	3.30¢			3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)					3.45¢		3.432¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢			(Canton = 4.10¢)				4.25¢		
PLATE								(Coatesville = 3.15¢, Claymont = 3.40¢, Geneva, Utah = 3.10¢)							
Carbon steel [12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	2.95¢				3.838[14]¢		3.298¢	3.190¢
Floor plates	4.20¢	4.20¢	4.20¢											4.716¢	4.656¢
Alloy	3.80¢	3.80¢	3.80¢		(Coatesville = 4.50¢)									4.316¢	4.256¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 2.95¢, Bethlehem = 2.80¢)					3.43[10]¢		3.040¢	2.932¢
SPRING STEEL, C-R															
0.06 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE [9]															
Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56[13]¢		4.622¢	4.006¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)							5.28[13]¢		5.072¢	4.964¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢	3.756¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt	Subject to negotiation			Subject to negotiation		
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation			Subject to negotiation		
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt., Beth	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.78
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo	Co	Base Per lb
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., per 100 lb	$2.75
Angle splice bars, 100 lb	3.25
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.05¢
Tie plates, Fittsburg, Calif.	3.20¢
Track bolts	7.00¢
Track bolts, heat treated, to rail roads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, St. Louis, Kansas City, Minnequa, Colo., Birmingham; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base per keg	Delivered San Francisco
Standard & coated nails	$4.25†	$5.31
Galvanized nails‡‡	4.00†	5.01
Cut nails, carloads, Pittsburgh base	5.80*	....

†10¢ additional at Cleveland, 35¢ at Worcester. ‡‡ Plus $2.75 per 100 lb galvanizing extra. *Less 20¢ to jobbers.

	Base per 100 lb	
Annealed fence wire	$4.20‡	$5.21
Annealed galv. fence wire	4.65‡	5.66

‡10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base column	
Woven wire fence*	91	114
Fence posts, carloads	90††	...
Single loop bale ties	91	115
Galvanized barbed wire**	101	121
Twisted barbless wire	101	...

* 15½ gage and heavier. ** On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	Hi Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	....	5.30	5.30	5.30	5.30	5.30
Galvanized	....	5.85	...	....	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	...

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
½-in.	50½	34½
¾-in.	53½	38½
1-in.	56	41½
1¼-in.	56½	42
1½-in.	57	42½
2 in.	57½	43
2½ and 3-in.	58	43½
Wrought Iron, buttweld		
⅛-in.	+ 7	+29
¼-in.	2½	+19
⅜ and ½-in.	8	+11
¾-in.	13½	+ 7½
1-in.	14	+ 7
Steel, lapweld		
2-in.	49	34
2½ and 3-in.	52	37
3½ to 6-in.	54	39
Steel, seamless		
2-in.	48	33
2½ and 3-in.	51	36
3½ to 6-in.	53	38
Wrought Iron, lapweld		
2-in.	5½	+14½
2½ to 3½-in.	8	+10½
4-in.	12	+ 5
4½ to 8-in.	10	+ 6½

Extra Strong, plain ends

Steel, buttweld		
½-in.	49½	35
¾-in.	53½	39
1-in.	55½	42
1¼-in.	56	42½
1½-in.	56½	43
2-in.	57	43½
2½ and 3-in.	57½	44
Wrought Iron, buttweld		
⅛-in.	+ 2½	+23
¼-in.	3½	+17
⅜ to 2-in.	13	+ 7
Steel, lapweld		
2-in.	48	34
2½ and 3-in.	52	38
3½ to 6-in.	55½	41½
Steel, seamless		
2-in.	47	33
2½ and 3-in.	51	37
3½ to 6-in.	54½	40½
Wrought Iron, lapweld		
2-in.	8½	+11
2½ to 4-in.	17½	+ ½
4½ to 6-in.	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

OD in in.	Gage BWG	Seamless Hot-Rolled	Seamless Cold-Drawn	Electric Weld Hot-Rolled	Electric Weld Cold-Drawn
2	13	$16.67	$19.99	$16.17	$19.39
2½	12	22.42	26.87	21.75	26.06
3	12	24.93	29.90	24.18	29.00
3½	11	31.17	37.39	30.23	36.27
4	10	38.69	46.38	37.53	44.99

CAST IRON WATER PIPE

Per net ton

6-in. to 24-in. del'd Chicago $91.12
6-in. to 24-in. del'd New York..... 89.18
6-in. to 24-in., Birmingham 79.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less 105.90

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

Percent Off List

½ in. & smaller x 6 in. & shorter.. 45
9/16 & ⅝ in. x 6 in. & shorter..... 46
¾ in. & larger x 6 in. & shorter.... 43
All diam, longer than 6 in. 41
Lag, all diam over 6 in. long..... 44
Lag, all diam x 6 in. & shorter..... 46
Plow bolts 54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller 43
9/16 to 1 in. inclusive 42
1⅛ to 1½ in. inclusive 40
1⅝ in. and larger 35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller		46
½ in. and smaller	44	..
½ in. through 1 in.		44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in. ..	41	42
1⅝ in and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate .... 65 and 10
In bulk 75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets

(½ in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $5.65
F.o.b. Lebanon, Pa. 5.80

Small Rivets

(7/16 in. and smaller)
Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 55

Cap and Set Screws

(In packages) *Percent Off List*

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright 53
¾ to 1 in. x 6 in., SAE 1035, heat treated 44
Set screws, oval points 55
Milled studs 29
Flat head cap screws, listed sizes.. 16
Fillister head cap, listed sizes..... 37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer $5.95
Old range, nonbessemer 5.80
Mesabi, bessemer 5.70
Mesabi, nonbessemer 5.55
High phosphorus 5.55

Prices quoted retroactive to Jan. 1, 1947.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh.....24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh .....30⅝¢ to 34⅝¢
Copper, reduced, 150 and 200 mesh .....30½¢ to 32¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots ... 10¢ to 17¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags.. 7.4¢ to 8.5¢
Domestic sponge iron, minus 48 mesh ..... 10¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots ..... 8¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots .....63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe ..... 44¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe..... 39½¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe.....90¢ to $1.75
Aluminum, 100, 200 mesh, carlots .....23¢ to 29¢
Antimony, 100 mesh ..... 44¢
Cadmium, 100 mesh $2.00
Chromium, 100 mesh and finer.. $1.025
Lead, 100, 200 & 300 mesh 20½¢ to 25½¢
Manganese, minus 325 mesh and coarser ..... 59¢
Nickel, 100 mesh ..... 51½¢
Silicon, 100 mesh ..... 29¢
Solder powder, 100 mesh..8½¢ plus metal
Stainless steel, 302, minus 100 mesh...75¢
Tin, 100 mesh ..... 90¢
Tungsten metal powder, 98%-99%, any quantity, per lb..... $3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb. $2.65
Under 100 lb $2.90

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$12.00 to $13.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd	$18.60
Chicago, f.o.b.	17.50
New England, del'd	19.75
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, f.o.b.	17.75
Swedeland, Pa., f.o.b.	17.75
Buffalo, del'd	18.75
Ashland, Ohio, f.o.b.	15.50
Painesville, Ohio, f.o.b.	16.60
Erie, del'd	19.95
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birmingham, del'd	15.75

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

Carloads, Per 1000

No. 1, Ohio $67.00
First quality, Pa., Md., Ky., Mo., Ohio 73.00
First quality, New Jersey 78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio 67.00
Sec. quality, New Jersey 70.00
No. 2, Ohio 59.00
Ground fire clay, net ton, bulk..... 10.50

Silica Brick

Pennsylvania and Birmingham $73.00
Chicago District and Alabama 82.00
Silica cement, net ton (Eastern)... 12.50
East Chicago 13.50

Chrome Brick

Per Net Ton

Standard chemically bonded, Balt., Plymouth Meeting, Chester $64.00

Magnesite Brick

Standard, Balt. and Chester $86.00
Chemically bonded, Baltimore 75.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk $46.50
Domestic, f.o.b. Chewelah, Wash., in bulk 24.00
in sacks 28.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest; add 10¢; Missouri Valley; add 20¢..$11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.47	$5.73	$5.82	$4.78	$5.68	$4.82	$4.55	$4.83	$5.53	$8.34	$8.44	$9.88	$9.95
New York	4.71	5.72[1]	6.11	5.03	5.86	5.06	4.75	5.02	5.57	8.40	8.50	9 92	10.02
Boston	4.76	5.63[12]	6.16[12]	4.76	6.73	5.11	4.82	4.98	5.63	8.62	8.72	9.98	10.08
Baltimore	4.31	....	5.71	4.78	....	4.78	4.68	4.81	5.51	....	....	....	....
Norfolk	4.80	....	....	5.20	....	5.05	5.05	5.10	5.90	....	....	....	....
Chicago	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Milwaukee	4.429	5.279[1]	5.629	4.529	5.629[5]	4.779	4.579	4.579	5.279	8.379	8.479	9.629	9.729
Cleveland	4.25	†4.95	5.78	4.52	5.00	4.60†	4.65	4.40	5.10	8.33	8.43	9.30	9.49
Buffalo	4.25	5.10	6.00	4.70	5.65[5]	4.95	4.40‡	4.40‡	5.10	8.05	8.15	9.30	9.40
Detroit	4.35	5.20	6.02	4.72	5.63	4.88†	4.77	4.50	5.22	8.50	8.60	9.73	9.78
Cincinnati	4.51	5.19	5.74	4.74	5.70	4.95	4.79	4.75	5.45	....	....	....	....
St. Louis	4.58	5.43[1]	5.87	4.68	5.82	4.88	4.73	4.73	5.47	8.57	8.67	9.82	9.92
Pittsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
St. Paul	4.63	5.48[1]	5.88[2]	4.73[7]	....	4 93[7]	4.78[7]	4 78[7]	5.91[6]	....	....	....	....
Omaha	5.165	.....	6.565	5.265	....	5.515	5.315	5.315	6.015	....	....	....	....
Indianapolis	4.553	5.324	5.874	4.653	5.753	4.903	4.703	4.703	5.403	....	....	....	....
Birmingham	4.45[11]	.....	5.85	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6 04	....	....	....	....
Memphis	4.82[11]	5.87[1]	6.37	5.02[11]	....	5.17[11]	4.97[11]	4.97[11]	5 87	....	....	....	....
New Orleans	*4.99[11]	6.28[1]	....	5.19[11]	....	5.34[11]	*5.04[11]	*5.14[11]	6.28[6]	....	....	....	....
Houston	5.30	....	6.60	5.25	....	5.35	5.15	5.30	6.80	9.40[17]	9.20[17]	10.35[17]	10.45[17]
Los Angeles	5.75	7.35[1]	7.40	6.05	8.70[5]	5.55	5.35	5.50	7 35[14]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
San Francisco	5.40[8]	6.65	6.85	5.75[8]	....	5.50	5.20	5.05	7.50[10]	9.55[15]	9.35[15]	10.95[15]	11.05[15]
Seattle	5.45[4]	7.25[2]	6.85	5.60[4]	....	5.60[4]	5.25[4]	5.45[4]	7.45[14]	....	8.55[16]	....	11.15[16]
Portland	5.30[4]	7.10[2]	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.55[4]	7.45[14]	....	....	....	....
Salt Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 450 to 1499 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) 1000 to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ⅝ in. thick and 90 in. wide.

‡ Add 35¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	37.00	37 50	38.00	38.50	.....
Birmingham	38.88	36.38-39.38	.....	.....	.....
Buffalo	36 00-39 50*	36.00-40 00*	36.50-40.50*	.....	.....
Chicago	37.50	38.00	38.50	39.00	.....
Cleveland	35 50-39 25*	36.00-39.75*	36 50-40.25*	.....	.....
Duluth	38.00	38.50	39.00	39.50	.....
Erie	37.50	38.00	38.50	39.00	.....
Everett	...	45.00	45.50	.....	.....
Granite City	36.50	37.00	37.00	.....	.....
Neville Island	39.00	39 50	39.50	40.00	.....
Provo	36 00	36.50	.....	.....	.....
Sharpsville	39 00	39.50	39 50	40.00	.....
Steelton	37 00	.....	39.50	.....	42.00
Struthers, Ohio	39 50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	37.50	38.00	38.50	39.00	.....
Troy, N. Y.	37 00	37 50	38 00	38 50	42.00
Youngstown	38.00	38.50	39.50	39.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	5.78	.....	.....	.....	.....	47.78
Brooklyn	Bethlehem	3 60	40 60	41 10	41.60	42.10	.....
Cincinnati	Birmingham	5.85	44.73	42 23-45 23	.....	.....	.....
Jersey City	Bethlehem	2.21	39 21	39 71	40.21	40.71	.....
Los Angeles	Provo	7 13	49 66	50 16	.....	.....	.....
Mansfield	Cleveland-Toledo	2.56	38 06-41 81*	38.56-42.31*	39 06-42 81*	39.56	.....
Philadelphia	Bethlehem	2.00	39 00	39.50	40 00	40 50	.....
Philadelphia	Swedeland	1 21	46 21	46 71	47.21	47.71	.....
Philadelphia	Steelton	2 59	39 59	.....	.....	.....	44.59
San Francisco	Provo	7.13	49 66	50 16	.....	.....	.....
Seattle	Provo	7.13	49 66	50 16	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	37.25	37.75	37.75	.....	.....

* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight. Foundry and malleable grades at Chicago and Valley furnaces, and basic at Valley, were quoted in error last week on Comparison of Price Page. Revised prices are quoted this week under date of Dec. 30. Average price for southern iron delivered Cincinnati revised to reflect all three Birmingham producers' prices.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$47.50; f.o.b. Buffalo—$48.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous $50.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $57.48. High phosphorous charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$145
Less ton lots (packed)	189
Delivered Pittsburgh	151

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets

Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$46.00	$47.00
F.o.b Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	33
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	33
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% mn.	23.00	24.85	26.05
0.10% max. C	22.50	24.35	25.55
0.15% max. C	22.00	23.85	25.05
0.30% max. C	21.50	23.35	24.55
0.50% max. C	21.00	22.85	24.05
0.75% max. C, 7.00% max. Si	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	7.80
Ton lots	9.45

Briquets

Contract basis, carlots, bulk freight allowed, per lb of briquet

	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $73.00 f.o.b. Keokuk, Iowa; $78.75 f.o.b. Niagara Falls; $70.75, f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	16.90	17.50	18.10
97% Si, 1% Fe	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si. 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.50	..	..
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Ferrochrome (65-72%Cr, 1% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr, 4-6% C, 6-9% Si	18.60	19.00	19.15

Briquets

Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S M Ferrochrome

Contract price, cents per pound chrominum contained, lump sie, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, packed, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	97.00	98.50	99.75
0.50% max. C	93.00	94.50	95.75
9.00% min. C	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots	$1.85	$2.70 $3.40
Less ton lots	2.20	3.05 4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr. 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ⅛ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed — $2.25

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.

Openhearth	$3.90
Crucible	3.00
High speed steel (Primos)	3.10

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2 — $1.20

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb

Ton lots	$2.50
Less ton lots	$2.55

Ferromolybdenum, 55-75%, f.o.b Langeloth, Washington, Pa., per pound contained Mo. — 88¢

Calcium molybdate, 40-45%, f.o.b Langeloth, Washington, Pa., Per pound contained Mo. — 88¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo — 80¢

Molybdenum oxide, in cans, f.o.b Langeloth and Washington, Pa., per pound contained Mo — 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti — $1.33

Less ton lots — $1.36

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti — $1.38

Less ton lots — $1.40

High carbon ferotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton — $142.50

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton — $65.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Carload lots — 18.40¢

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy

Carload, bulk — 6.00¢

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload	6.90¢
Ton lots	7.40¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Car lots	9.00¢
Ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed. Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
100 lb or more	$1.20	$1.23	$1.21

Manganese — Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max C.

Ton lots	$1.89	$1.903	$1.936
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$1.80	$1.8125	$1.8448

Silicaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots — 39.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed on 50 lb and over

No. 1	93¢
No. 6	63¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed. Ti 15—17%, B 0.90—1.15%, Si 2.5—3.0% Al 1.0—2.0%.

Ton lots, per pound — 8.0¢